TECHNOLOGY DEPT.

A PICTORIAL SURVEY OF CURRENT PRACTICE, EQUIPMENT AND MATERIALS

First Copy

First Copy

PUBLIC LIBRARY
NOV 28 1940
DETROIT

Construction Methods

NOVEMBER
1940

SMALL TOOLS ON CONSTRUCTION—An 8-page pictorial section of on-the-job applications.

Boeing Aircraft's Plant Expansion for Defense Needs • Small-Bore Tunnel in Hard Rock •

Arc-Welding for Equipment Maintenance • Hydraulic Coupling for Winch Drive

McGRAW-HILL PUBLISHING COMPANY, INC. • PRICE 50 CENTS

PILING JOB COSTS ARE CUT by the Inland 5-Point Plan

You can save time and money on your next piling job by using the Inland 5-Point Plan of Cooperation. This plan is a complete service. It starts with the earliest design stage and ends only when the job is finished.

Here is what it gives you—

1.—Project analysis, offering you the benefit of the latest design experience drawn from actual jobs in all parts of the country.

2.—Detail assistance suggesting the best construction practices and economies. Design help on special fabricated sections to meet the required strength.

3.—Construction methods suggested, taking into consideration the equipment available, and the job layout.

4.—Installation layouts furnished, and materials expedited between mill and job from start to finish.

5.—Inland Steel Sheet Piling is made of special analysis steel providing unusual toughness, and a tensile strength in excess of 70,000 lb. per sq. in. The Inland interlock permits free driving, yet remains watertight under pressure.

This combination of engineering aid, mill service, and Inland high quality piling gives maximum savings of time and money. Call or write an Inland office.

SHEETS • STRIP • TIN PLATE • BARS • PLATES • FLOOR PLATES • STRUCTURALS • PILING
RAILS • TRACK ACCESSORIES • REINFORCING BARS

TECHNOLOGY DEPT.

INLAND STEEL CO.

PILING

38 S. Dearborn St., CHICAGO • District Offices: MILWAUKEE • DETROIT • ST. PAUL • ST. LOUIS • KANSAS CITY • CINCINNATI

CURRENT JOBS

.... and Who's Doing Them

BUILDINGS

Public—In Detroit, Mich., **O. W. Burke Co.**, local contractor, will build, for Chrysler Corp., plant for construction of tanks, to be financed by War Department at cost of $20,000,000. **Sanderson & Porter,** of New York City, received contract to construct ammunition loading plant in Wilmington, Ill., for $14,000,000 on cost-plus-fixed-fee basis. At Fort George G. Mead, Md., contract for housing facilities was awarded to **Consolidated Engineering Co.**, of Baltimore, for $7,353,507 on cost-plus-fixed-fee basis. Low bidder for contract for construction of buildings for cantonment at Fort Lewis, Wash., was **Sound Construction & Engineering Co.**, of Seattle, for $6,390,000. In Indiantown Gap, Pa., National Guard cantonment is under construction by **W. F. Trimble & Sons Co.** and **Ferguson & Edmondson Co.**, both of Pittsburgh, and **Huffman-Wolfe Co.**, of Columbus, Ohio, for $5,413,735 on cost-plus-fixed-fee basis. Successful bidders for contract to construct housing and ammunition facilities at Naval Mine Depot and Naval Fuel Depot at Yorktown and Newport News, Va., were **Virginia Engineering Co., Inc.**, of Newport News, and **Wise Construction Co.**, of Richmond, for $4,026,260 on cost-plus-fixed-fee basis. **Far West Construction Co.**, of Seattle, was awarded contract for construction of temporary housing, barracks, mess halls, recreation centers and storehouses at Fort Lewis, Wash., for $4,075,032. Contract for the construction of 1,200 dwellings for Navy personnel at destroyer base and Marine Corps base in San Diego, Calif. went to **W. Simpson Construction Co.**, of Los Angeles, for approximately $3,000,000. **W. P. Neil Co., Ltd.**, of Los Angeles, Calif., was awarded contract for buildings, road, sidewalks, railroad tracks, services, street lighting and fire protection system at Naval Ammunition depot in Hawthorne, Nev., for $2,146,000.

Industrial—In River Rouge, Mich., **American Bridge Co.**, of Detroit, is erecting structural steel for Ford Motor Co.'s airplane engine plant at cost of $4,000,000. Generating plant in Port Washington, Wis., is under way by **Worden-Allen Co.**, of Milwaukee, for $7,100,000. Shipbuilding plant in Orange, Tex., will be constructed by **Bechtel-McCone-Parsons Corp.**, of Los Angeles, Calif., for $5,000,000. Recycling plant in Falfurrias, Tex., will be built by **Hudson Engineering Co.**, of Houston, for approximately $2,100,000. Contract for Flintkote Corp. plant addition at Meridian, Miss., went to **Rust Engineering Co.**, of Birmingham, Ala., for $1,000,000. Aircraft plant for Bell Aircraft Corp., of Niagara Falls, N. Y., will be constructed by **Austin Co.**, of Cleveland, Ohio, for $1,000,000 including equipment.

HEAVY CONSTRUCTION

At Newport News, Va., contract for construction of shipways, pier, cranes, power, machine shop, etc., went to **Newport News Shipbuilding & Dry Dock Co.**, for $14,000,000. Shipbuilding slips and buildings in Quincy, Mass., are under construction by **Bethlehem Steel Co.**, local contractor, for $13,427,500. **New York Shipbuilding Corp.**, of Camden, N. J., received contract for ways cranes, tools and equipment, turret shop wing, etc., to be constructed in Camden, N. J., for $10,500,000. **McLean Contracting Co.**, of Baltimore, Md., received contract for rehabilitation of existing piers and breakwater at Submarine Base in Norfolk, Va., for $3,226,500 on cost-plus-fixed-fee basis. In Staten Island, N. Y., **Bethlehem Steel Co.**, of New York City, was awarded contract for buildings and outfitting piers with price of $2,706,000. Seaplane ramps, hangars, parking areas, recreation building, aircraft storehouse and laundry in Pearl Harbor, T. H., is under construction by **Hawaiian Dredging Co. & Associates**, of Honolulu, for $2,231,000 on cost-plus-fixed-fee basis. In Nanaimo, B. C., Canada, permanent military camp will be built by **Northern Construction Co. Ltd.**, of Vancouver, Canada, for $1,250,000. Floating dry dock yard at Mare Island, Calif., will be built by **Pacific Bridge Co.**, of San Francisco, for $1,649,000.

HIGHWAYS AND BRIDGES

Among recent highway and bridge contract awards are the following: California: $209,302 to **Piazza & Huntley,** of San Jose, and **Trewhitt, Shields & Fisher,** of Fresno. Georgia: $317,518 to **M. J. Carroll,** of Leesburg, Fla. Illinois: $194,973 to **Waukegan Construction Co.**, of Springfield. Louisiana: $206,666 to **Austin Construction Co.**, of Dallas, Tex., Michigan: $219,550 to **Lewis & Frisinger Co.**, of Ann Arbor. New York: $796,313 to **Arute Bros., Inc.**, of New Britain, Conn.; $640,912 to **Lane Construction Corp.**, of Conn.; $1,068,871 to **Turecamo Contracting Co.**, of Brooklyn, N. Y. North Carolina: $386,590 to **R. E. Mills,** of Frankfort, Ky. Oregon: $194,922 to **M. L. O'Neil,** of Eugene. Pennsylvania: $518,059 to **H. W. Shaull & Son,** of Mechanicsburg. Texas: $248,574 to **Austin Road Co.**, of Dallas; $207,408 to **Oran Speer,** of Alvord. Virginia: $518,461 to **Kelley Construction Co.**, of West Virginia; $256,369 to **W. H. Scott, Inc.**, of Franklin. Washington: $231,030 to **Northwest Construction Co.**, of Seattle. **Arthur A. Johnson Corp. & Necaro Co., Inc.**, of Long Island City, submitted bid for subway section contract in Brooklyn, N. Y., at price of $1,199,000. Substructure contract for Connecticut River bridge in Connecticut went to **A. I. Savin Construction Co.**, of East Hartford, for $672,500; contract for superstructure went to **American Bridge Co.**, of New York City, for $1,236,968.

NOVEMBER, 1940
Copyright, 1940
Established 1919
McGraw-Hill Publishing Co., Inc.
330 West 42nd St., New York
Construction Methods
A Pictorial Survey of Current Practice, Equipment and Materials
ROBERT K. TOMLIN, Editor
A. E. PAXTON, Manager
Editorial Staff: Vincent B. Smith, Paul Wooton (Washington)
N. A. Bowers (San Francisco) Nelle Fitzgerald
A McGRAW-HILL PUBLICATION

The HOW of it

For the benefit of readers concerned with the practical application of method or equipment the following references are to articles or illustrations in this issue that tell:

How **ARC WELDING** aided equipment repair. — p. 39
How **TUNNELS WERE BUILT** to house utility lines and give access to manufacturing floors of aircraft plant. — p. 43
How **STEEL ERECTION** for expansion of aircraft factory building was handled by crawler cranes. — p. 45
How **METAL INSULATION SHEETS** for house construction were cut five at a time. — p. 46
How **EARTH WAS COMPACTED** by pneumatic tamper. — p. 46
How **CONCRETE WALL** was demolished with aid of 75-ton hydraulic jack. — p. 46
How **MIDGET BUCKET** cleaned sewer catch-basins. — p. 46
How **PNEUMATIC HAMMER** drove spikes in wood deck planking. — p. 47
How **SMALL TOOLS** were employed to advantage on big jobs. — p. 48
How **CURING OF CONCRETE** for floors and roofs was done with asphaltic spray. — p. 49
How **BUILDING MATERIALS** were installed with aid of small tools. — p. 50
How **WALL SURFACE TEXTURES** were obtained by various devices. — p. 53
How **SOIL PROCESSING** for road building was handled by versatile machine. — p. 54
How **SMALL-BORE TUNNELS** were driven at rate of five rounds per day. — p. 56
How **"CHERRY-PICKER"** lifted empty tunnel muck cars. — p. 56
How **FULL-FACE DRILLING** for rock tunnel was planned to produce maximum cut. — p. 58
How **ROAD WIDENING MACHINE** cut 4-ft. strip for new pavement. — p. 58
How **TRUCK WAS CONVERTED** to carry long steel reinforcing bars. — p. 59
How **NON-SKID SURFACE** on concrete pavement was produced by brooms with steel bristles. — p. 59
How **WOOD BARRACKS** were built by tilt-up method at Army camp. — p. 63
How **PUMPED CONCRETE** was delivered for subway lining. — p. 65
How **HYDRAULIC COUPLING** improved winch control of floating swing bridge. — p. 66

CONSTRUCTION METHODS, November, 1940. Volume 22. Number 11. Published Monthly, price 20¢ a copy. Allow at least ten days for change of address. All communications about subscriptions should be addressed to the Director of Circulation, 330 West 42nd Street, New York, N. Y. **Subscription rates**—United States, Canada, Mexico and Central and South American countries, $1.00 a year, $1.50 for two years, $2.00 for three years. Great Britain and British Possessions 18 shillings a year, 36 shillings for three years. All other countries $2.00 a year, $6.00 for three years. Entered (or reentered) as second class matter December 16, 1936, at the Post Office at New York, N. Y., U. S. A., under the act of March 3rd, 1879. Printed in U. S. A. Cable address: "McGrawhill, New York." Member of A.B.P. Member of A.B.C. Contents copyrighted 1940 by McGraw-Hill Publishing Co., Inc., 330 West 42nd Street, New York, N. Y.

McGRAW-HILL PUBLISHING COMPANY, INC., 330 WEST 42d STREET, NEW YORK, N. Y.

JAMES H. McGRAW, Founder and Honorary Chairman

Editorial and Publishing Offices: 330 West 42nd St., New York; 520 North Michigan Ave., Chicago; 68 Post St., San Francisco; Aldwych House, London, W. C. 2, England. Branch Offices: Washington; Philadelphia; Cleveland; Detroit; St. Louis; Boston; Atlanta, Ga.

JAMES H. McGRAW, Jr., President — **HOWARD EHRLICH**, Executive Vice-President — **MASON BRITTON**, Vice-Chairman — **B. R. PUTNAM**, Treasurer — **D. C. McGRAW**, Secretary — **J. E. BLACKBURN**, Circulation Manager

THE JOB JESTER

CARTOONS DRAWN FOR CONSTRUCTION METHODS

"So that's why Hank didn't want to repair that air hose leak this morning"

"Don't be alarmed, Mrs. Jones—the building contractors' men are only making a few alterations!"

NEW FACTORIES AND PLANT ADDITIONS IN USE WEEKS SOONER

SPEED DEFENSE CONSTRUCTION

'INCOR' 24-HOUR CEMENT PREVENTS WINTER SLOW-DOWN, CUTS COLD-WEATHER CONSTRUCTION COSTS

IT'S full speed ahead in defense construction. Hundreds of important projects like the new addition to United Aircraft Corporation factory (above), at East Hartford, Conn.—built with Lone Star Cement by Turner Construction Company, New York, general contractor; Albert Kahn Associates, Detroit, architects and engineers—are being pushed to completion, day and night, without a let-up.

WINTER PREPAREDNESS

But winter is just ahead—and now is the time to safeguard against the usual cold-weather slow-down. Defense construction cannot wait on the thermometer. Fortunately, it doesn't have to—'Incor' 24-Hour Cement makes possible normal job speed, even in dead of winter with its sub-freezing temperatures. By hardening thoroughly in one-third the usual time, this improved Portland cement minimizes freezing risk, cuts heat-protection costs by 50 to 60 percent, saves two to five days' delay on each pour.

'INCOR' SAVES VITAL WEEKS

These 'Incor' time savings add up to weeks—weeks that are vital in defense construction.

Make every day count this winter—speed completion of new factories and plant additions, highways and bridges, air and naval bases—use 'Incor'* 24-Hour Cement for top-speed construction at rock-bottom cost.

Write for copy of illustrated book, "Cold-Weather Concreting." Lone Star Cement Corporation, Room 2265, 342 Madison Avenue, New York. *Reg. U. S. Pat. Off.

LONE STAR CEMENT CORPORATION

MAKERS OF LONE STAR CEMENT · · · 'INCOR' 24-HOUR CEMENT

From Drilling Rigs to Car Loader

SMOOTH OPERATION

GEAR TEETH and wire rope perform quietly, economically when lubricated with a tough, wear-defying film of *Texaco Crater*. All trucks are fueled and lubricated exclusively with Texaco.

MACK TRUCK dumping into Allis-Chalmers Gyratory Crusher, the bearings of which are protected with *Texaco Crusher Oil*.

TEXACO MARFAK in the bearings of all belt conveyors, keeps down wear, sealing out dust, dirt and rain water.

Texaco Dealers invite you to enjoy Fred Allen in the new full-hour program of The Texaco Star Theatre . . . with Kenny Baker, Al Goodman's Orchestra and a great cast. Every Wednesday Night—Columbia Network. 9:00 E.S.T., 8:00 C.S.T., 10:00 M.S.T., 9:00 P.S.T.

WITH NO FEWER than 64 pieces of mechanical equipment in his charge, Superintendent W. B. Couch knows the value of smooth operation . . . and gets it.

Rock drills, shovels, trucks, crushers, conveyors, bulldozers, air compressors, gears and wire rope, even the freight-car scales in this quarry are lubricated exclusively with TEXACO.

You, too, can get smooth performance from your equipment, experience less wear, lower operating and maintenance costs by using Texaco Fuels and Lubricants.

Trained lubrication engineers will gladly cooperate in making savings with Texaco Products in your equipment. Phone the nearest of more than 2300 Texaco warehousing points in the 48 States, or write:

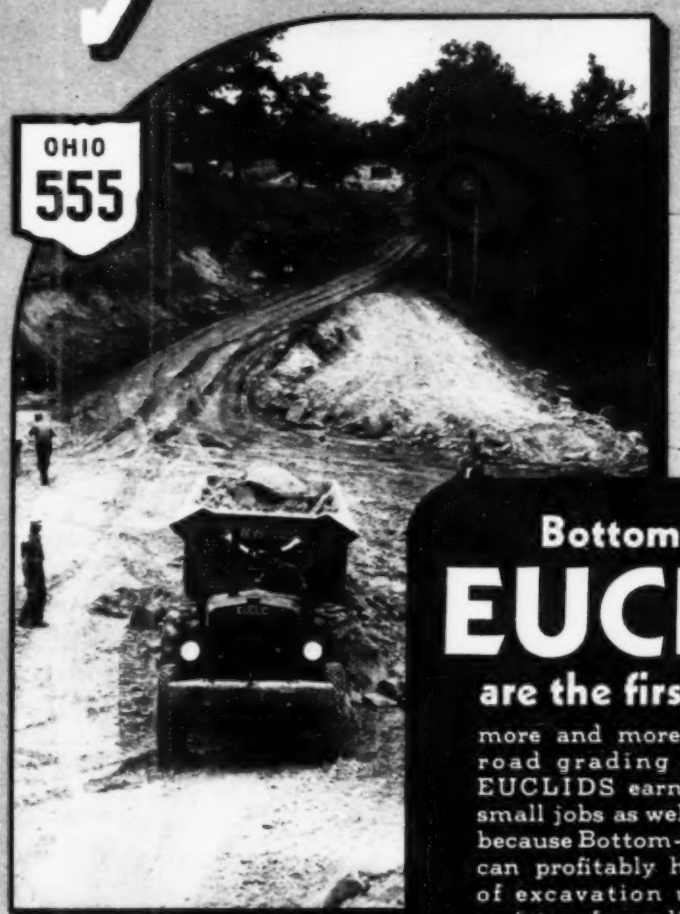
The Texas Company, 135 East 42nd Street, New York, N. Y.

SUPT. W. B. COUCH of Campbell Limestone Co., Greenville, S. C. An enthusiastic Texaco 100-percenter.

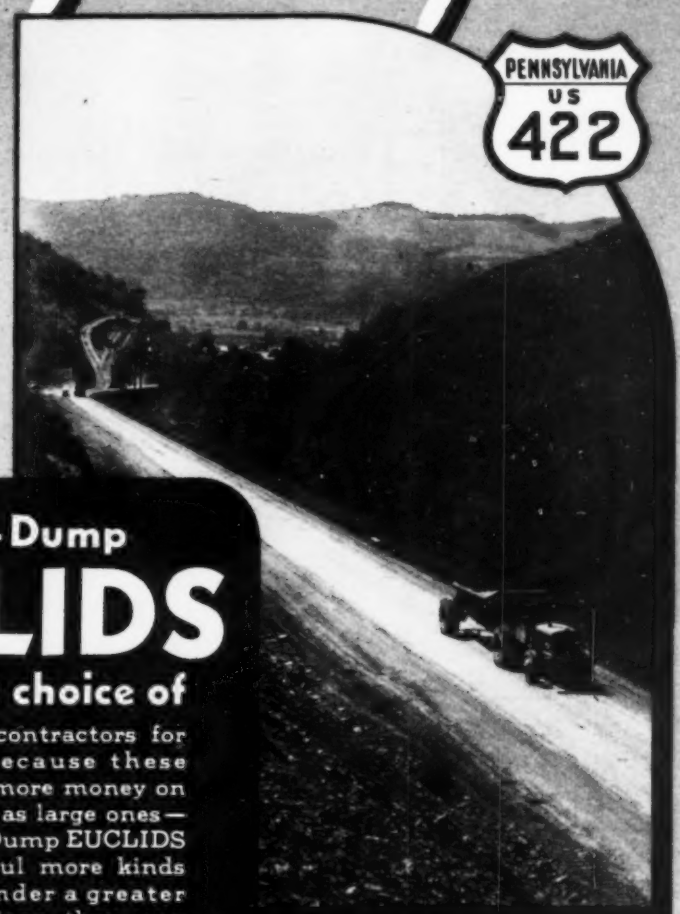
TEXACO
REG T M

TEXACO Industrial Lubricants

For road grading ...



W. P. McCarren
Zanesville, Ohio



Ralph Myers Construction Co.
Kittanning, Penna.

Bottom-Dump

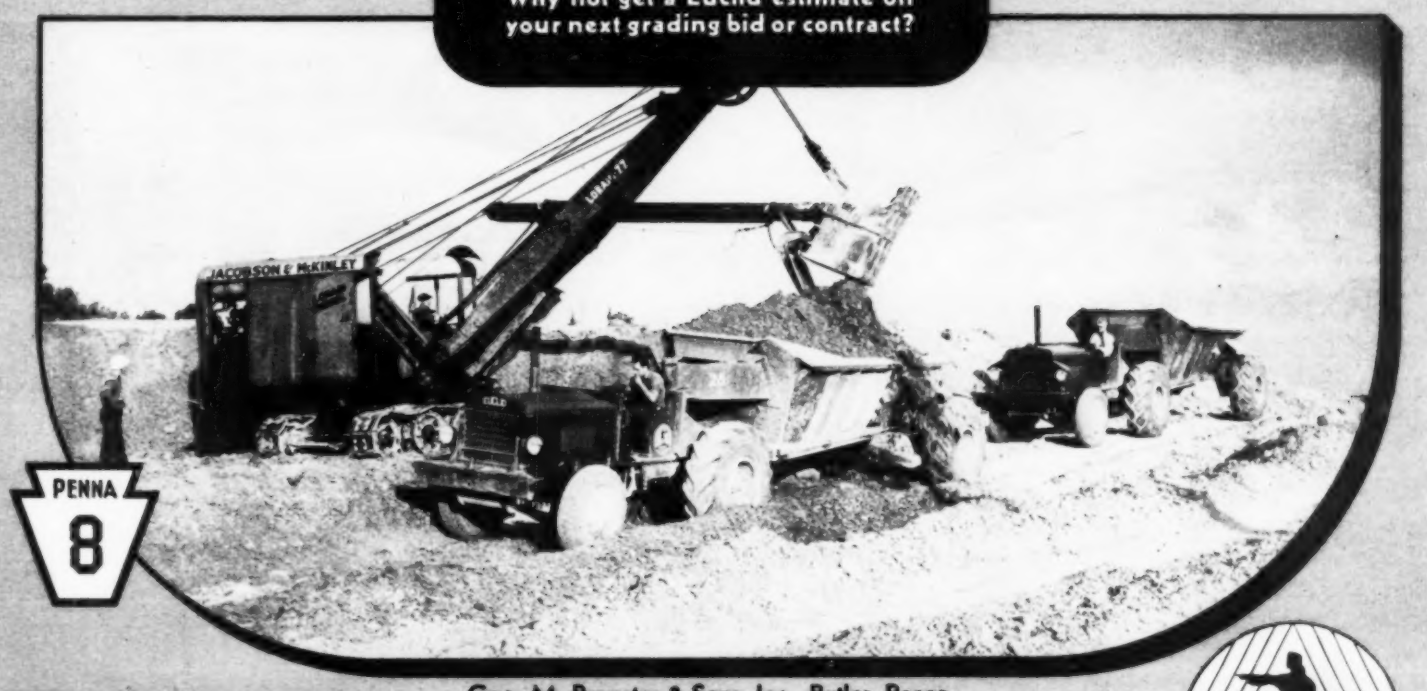
EUCLIDS

are the first choice of

more and more contractors for road grading because these EUCLIDS earn more money on small jobs as well as large ones—because Bottom-Dump EUCLIDS can profitably haul more kinds of excavation under a greater variety of conditions than any other equipment.

★ ★ ★

Why not get a Euclid estimate on your next grading bid or contract?



Geo. M. Brewster & Sons, Inc., Butler, Penna.

THE EUCLID ROAD MACHINERY CO.
CLEVELAND, OHIO U. S. A.

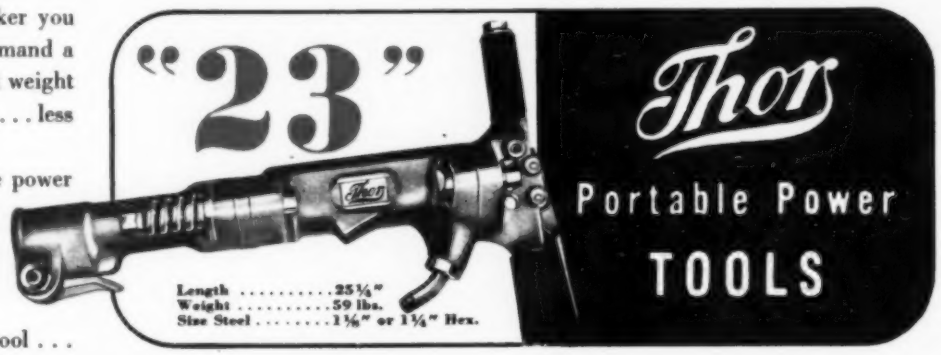
EUCLID
THE PIONEER

Extra POWER ⟶ Extra OUTPUT ⟶ Extra PROFITS on Every Job!

● **In Thor's new No. 23** medium weight paving breaker you have at last a machine for the scores of jobs that demand a heavy weight's power, but the handling ease of a light weight tool. Jobs where lighter weight means faster handling . . . less fatigue . . . and far greater output.

The No. 23's surprising new combination of more power and less weight is the result of new Thor construction features: A block type piston hammer that greatly increases the foot pound blows . . . A new cylinder that gives full effect to every hammer blow . . . Perfect balance . . . A handle that's remarkably cool . . . And a new Latch Type Retainer that's positive, simple and fast in operation.

Get the extra power . . . extra output . . . and extra profits that Thor's new No. 23 paving breaker can offer you! For full information, send a penny post card for Bulletin JMC-26B.



INDEPENDENT PNEUMATIC TOOL CO.

600 W. JACKSON BLVD., CHICAGO, ILL.

Cochise Rock Drill Mfg. Co. (Division), 6200 E. Slauson Ave., Los Angeles, Calif.

Birmingham · Boston · Buffalo · Cleveland · Detroit
Milwaukee · New York · Philadelphia · Pittsburgh · San Francisco
St. Louis · Toronto · London

HEIL HYDRAULIC TRAILBUILDERS—Built in seven sizes to fit all Cletrac Tractor Models. Blade can be angled to either side or set in bulldozer position.

HEIL TWIN-CABLE SCOOPS—Four wheel cable scoops built in 6, 8, 10, 12, 16 and 24 yd. capacities. For operation with 40 to 120 H. P. tractors.

HEIL HYDRAULIC BULLDOZERS—Built in seven sizes to fit all Cletrac Tractor Models.

HEIL Quality PRODUCTS

Equip yourself for profits

with HEIL EARTH-MOVING EQUIPMENT

The complete and dependable line of Heil Earth-Moving Machinery is designed and built for PROFITABLE operation—no matter how long the haul or how tough the digging. Heil Cable Scoops—Hydraulic Scoops—Bulldozers—Trailbuilders—Tamping Rollers—are built in types and capacities to suit your requirements.

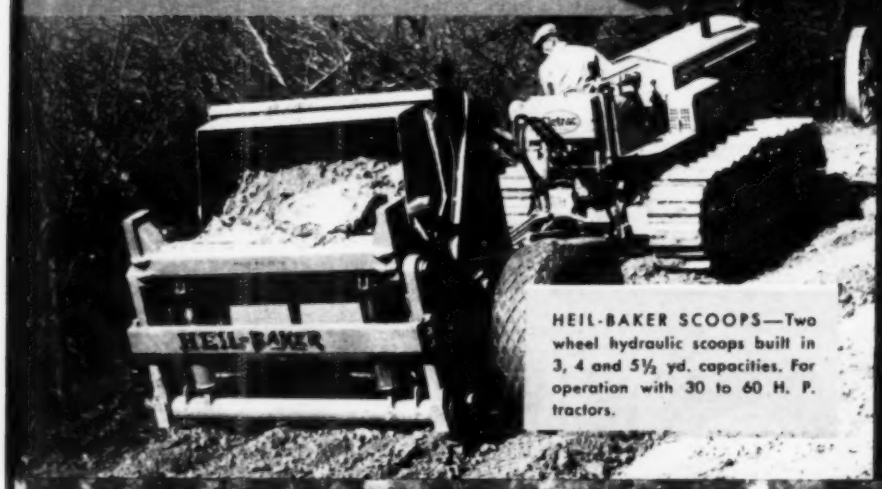
Write, wire or phone TODAY for your free copy of the new Heil Earth-Moving Catalog—Address:

THE HEIL CO.

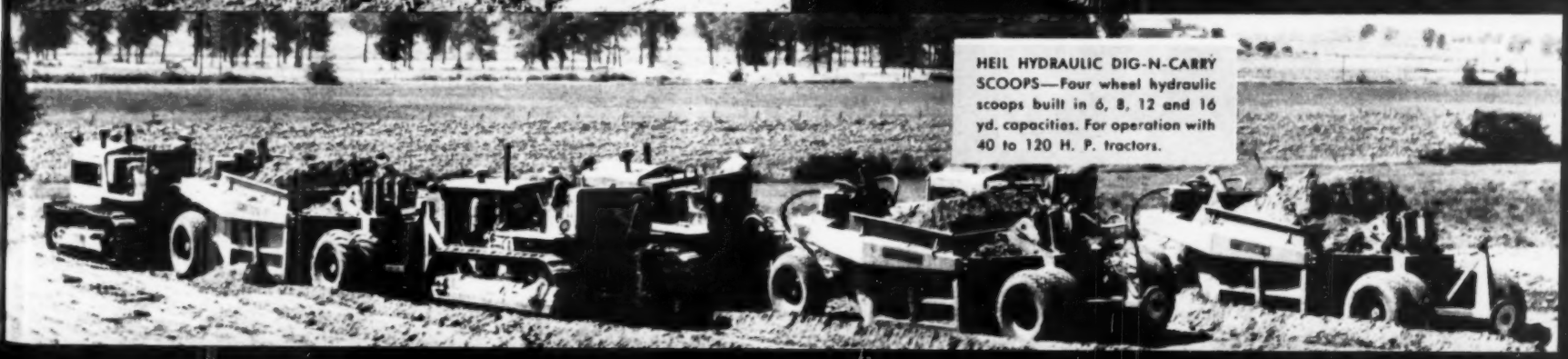
MILWAUKEE, WISCONSIN • HILLSIDE, NEW JERSEY

HEIL SHEEPSFOOT TAMPING ROLLERS—Built in single, double, or triple drum models, either oscillating or non-oscillating.

HEIL HYDRAULIC DUMP UNITS—A complete series of hydraulic hoists and heavy duty dump bodies for mounting on any truck model.

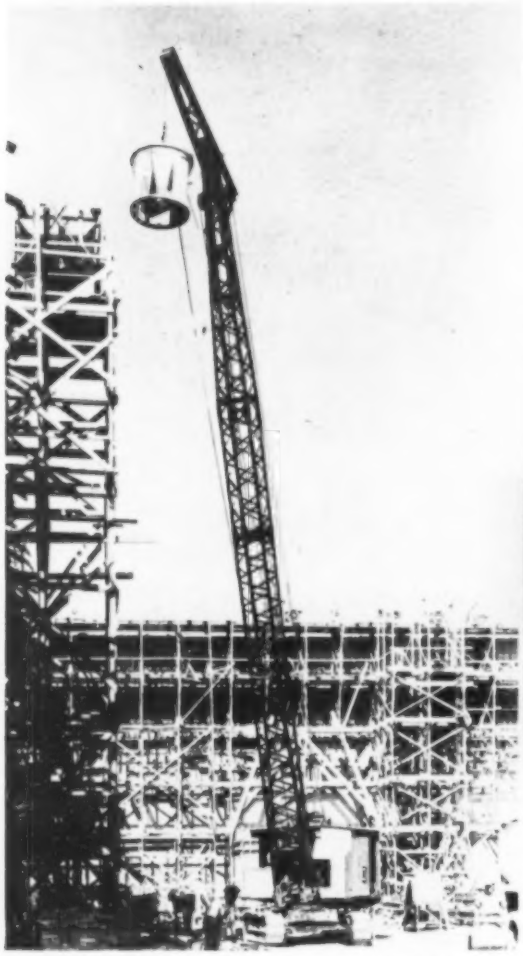


HEIL-BAKER SCOOPS—Two wheel hydraulic scoops built in 3, 4 and 5½ yd. capacities. For operation with 30 to 60 H. P. tractors.

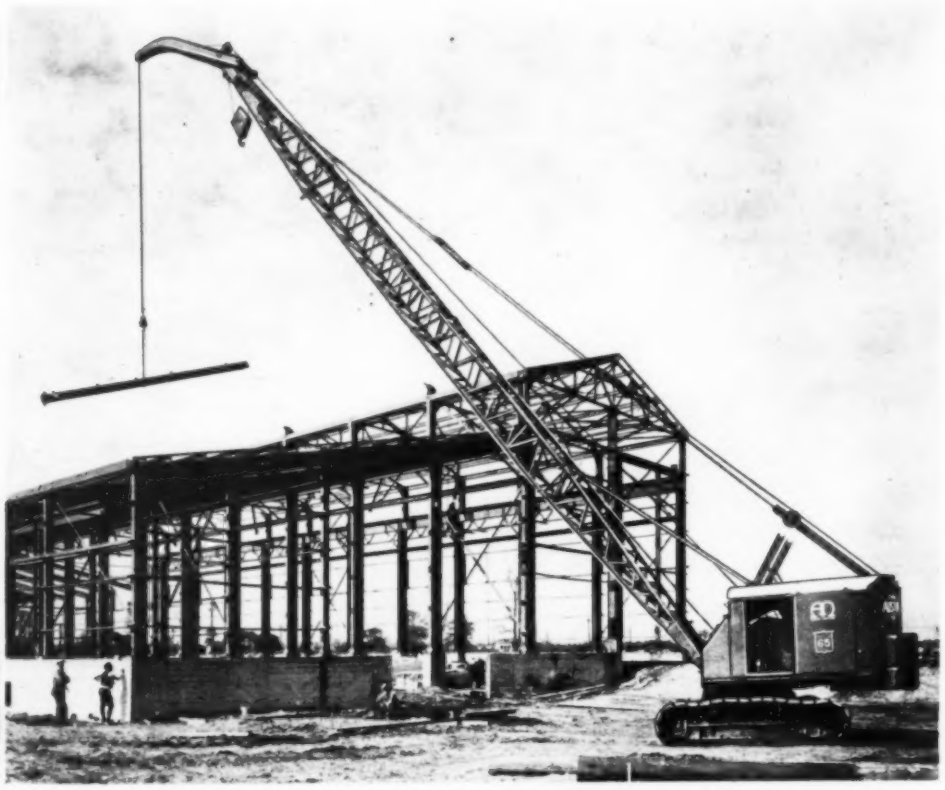


HEIL HYDRAULIC DIG-N-CARRY SCOOPS—Four wheel hydraulic scoops built in 6, 8, 12 and 16 yd. capacities. For operation with 40 to 120 H. P. tractors.

★ ★ ★ *Speeding National Defense*— from Coast to Coast with dependable, low-cost performance of BAY CITY equipment ★ ★ ★



17½ ton crane placing concrete for William Simpson Constr. Co. on aircraft factory in California—speed up your work with a BAY CITY.



20 ton crane equipped with pin-connected boom and adjustable jib setting steel for Austin Company on midwest plant expansion—speed up your work with a BAY CITY.

Power, speed and easy operation plus heavy-duty construction is built into BAY CITY convertible shovels. Crawler mounting to 1½ yd. with 25 ton rating and truck mounting to ¾ yd. with 20 ton rating. Booms up to 110 feet with fixed or adjustable jib. Let us send complete details—

Write or wire for Catalog H-2.

BAY CITY SHOVELS, Inc.
BAY CITY, MICHIGAN
Export Office: 330 W. 42 st., New York City (OPARO)

1 yd. dragline excavating and grading on new airbase in Florida, handling 1,600 yards each 8 hours—speed up your work with a BAY CITY.

BAY CITY

SHOVELS • CRANES • DRAGLINES • TRENCH-HOES • SKIMMERS

CASH ALLOWANCE
ON YOUR PRESENT MAGNETO

-if you trade it in NOW for a New Modern American Bosch

MAGNETO REPAIR AND REPLACEMENT ESTIMATE No. 77

From American Bosch Corporation, Springfield, Mass. Date May 9, 1940

To _____

Address Springfield, Mo.

City

YOUR MAGNETO
Make Amer. Bosch
Type & No. CK-4 Ed-36
Serial No. 284382 Impulse Coupling No
Rotation clw Timing Range Late

REPAIR ESTIMATE: Rebuilt to Factory Standards

Parts Requiring Replacement	Condition	Qty.	Part Number	Price
Brush	Worn	1	60076	.15
Supporting Post	Damaged	1	75054	.30
Screw	Worn	1	467	.15
Contact Point	"	1	77805	3.25
Weight for I.C.	"	2	46972	1.00
Winding	Soft + Weak	1	73360	9.25
Collector	Cracked	1	77706	1.95
Miscellaneous Small Parts				
			Total List	$16.05
			Parts Less 20%	12.84
			Labor	3.50
			TOTAL	16.34

IMPORTANT
Please supply following information and mail this copy to Trade Sales Division, American Bosch Corporation, Springfield, Mass.
- [x] Customer bought new American Bosch Magneto
- [ ] Had old magneto repaired
- [ ] Bought

REPLACEMENT ESTIMATE

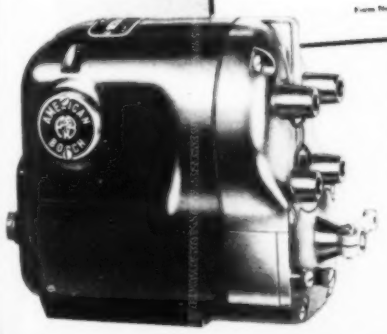
New American Bosch Super-Powered Magneto	List Price	$ 46.00
	Allowance for old magneto	7.50
TYPE MJB4C106 MIC400 ✓12	Less 20%	38.50
	NET COST	30.80
New _____ Make _____	List Price	$ _____
TYPE _____	NET COST	

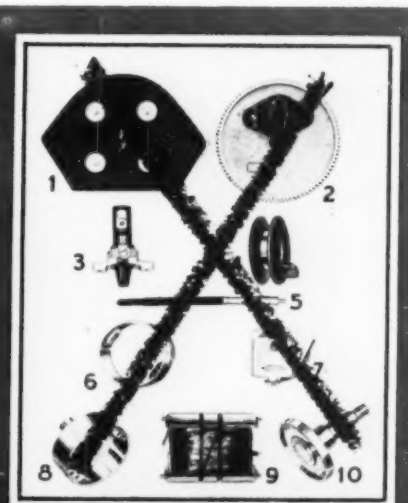
Considering the age of this magneto, the service it has given and the cost of repairing it
WE RECOMMEND: [ ] Overhaul [x] Replacement
Signed American Bosch Corp.

FACTORY COPY

MAKE THIS COMPARISON: Find out whether it's more economical for *YOU* to repair or to replace—Ask your American Bosch service station to examine *your* magnetos. He'll prepare an estimate on special form shown above, which specifies trade-in allowance on present magnetos.

Photo at right is an example of the expensive, commonly required replacement parts necessary in old style magnetos. At extreme right you see the *fewer, sturdier, less expensive* parts which accomplish the same function, and make the modern Super-Powered American Bosch a better, more rugged magneto.





MAYBE you assume your present old-style magneto merely needs repairing. But—you may discover that it's more economical for you to *replace* than to *repair*. Now you can find out free. Here's how:

Go to any American Bosch service station. They'll gladly examine each of your magnetos—prepare a *comparative* estimate for you on the special form American Bosch provides, as shown at left.

This form shows you in black and white the cost of repairing your old-style magneto . . . compares it to the cost of replacing with a new, modern American Bosch Super-Powered Magneto . . . indicates the cash allowance you can get on your present magneto under the American Bosch Magneto Trade-In Plan.

The newest American Bosch Super-Powered Magneto employs Alnico, amazing new, more powerful magnet metal. Result: This magneto has fewer rotating parts, less expensive parts, so much sturdier construction that magneto maintenance costs are often cut 50% or more.

Get the benefits of this new American Bosch Magneto—ask your American Bosch service station . . . or write us direct for "A Message To Magneto Users."

The American Bosch Magneto Trade-In Plan is subject to change or withdrawal without notice.

AMERICAN BOSCH CORPORATION
SPRINGFIELD, MASS.

AMERICAN BOSCH
Super Powered MAGNETO

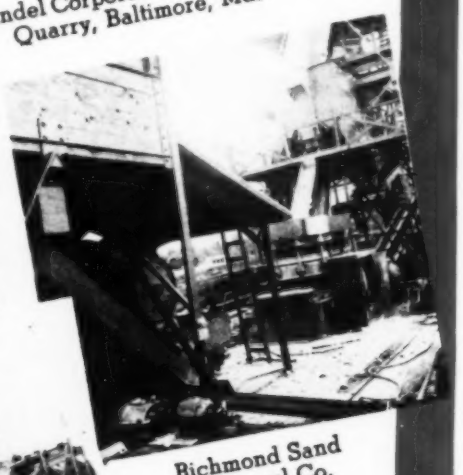
Modern Aggregate Plants . . . by TELSMITH

Like hundreds of Telsmith plants all over the world, these new rock crushing and gravel washing plants have operated smoothly, efficiently and profitably right from the start. A Telsmith plant means the latest in equipment—crushers to bin gates—Telsmith-designed-and-built for extra staying power, greater flexibility and capacity, lower operating and upkeep costs. And Telsmith *Balanced* Engineering Service and centralized responsibility fits that plant to your own particular needs. Write for Bulletin EP-10.

Pontiac Stone Co.
Pontiac, Ill.

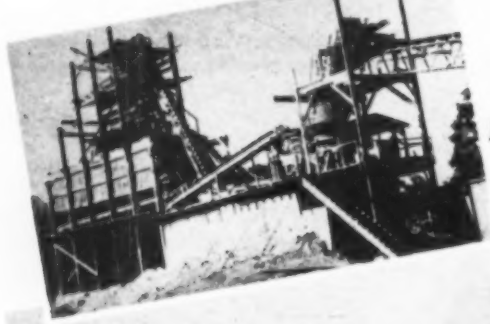
Crystal Concrete Products Co
Braintree, Mass.

Arundel Corporation, Woodberry Quarry, Baltimore, Md.



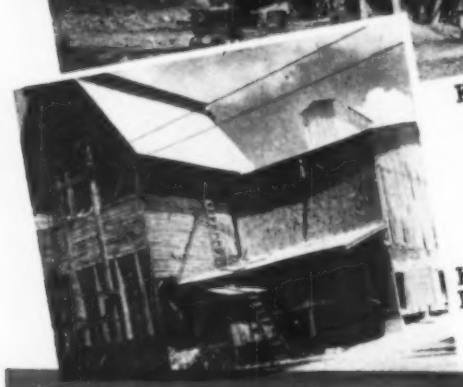
Richmond Sand & Gravel Co.
Richmond, Va.

Highspire Sand & Gravel Co.
Highspire, Pa.

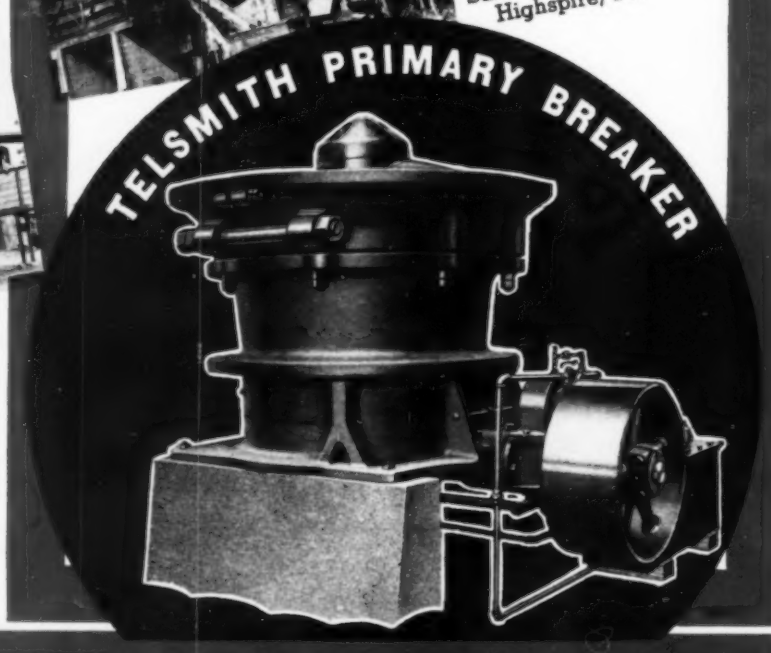


Arlington Stone Company
Leesburg, Va.

Kelly Run Stone Co.
Wilkes Barre, Pa.



Kentucky Stone Co.
Irvington, Ky. plant



SMITH ENGINEERING WORKS, 510 E. CAPITOL DRIVE, MILWAUKEE, WISCONSIN

50 Church St. New York City | 211 W. Wacker Drive Chicago, Ill. | 713 Commercial Trust Bldg. Philadelphia, Pa. | 91 Binney St. Cambridge, Mass. | Van Wheeler Eqpt. Co. Columbus, Ohio | Brandeis M. & S. Co. Louisville, Ky.
Charleston Trac. & Eqpt. Corp. Charleston, W. Va. | Roanoke Trac. & Eqpt. Co. Roanoke, Va. | Choctaw C. & M. Co. Memphis, Tenn. | Wilson-Wesner-Wilkinson Co. Knoxville and Nashville, Tenn. | United Steel Sales Toronto, Ont.

When These Two Columns ADD UP . . .

DESIGN

CENTER DRIVE: Turntable, crawler and shovel boom are all built to the time-proved principles of Center Drive design.

•

BALANCED TURNTABLE: Patented sloping machinery frame concentrates machinery weight to develop maximum capacities at minimum weight.

•

SIMPLICITY: A compact, accessible design whose fewer parts are huskier, stronger.

•

CONCENTRATED POWER: A direct-to-the-point application of power which can be concentrated all on one operation or spread over simultaneous ones. Gas, Diesel or electric.

•

MOBILITY: Two crawler speeds (and steering) in either direction. 30" wide treads available for minimum ground pressures. Travel brake.

•

CABLE OR CHAIN CROWD: Choice of independent Chain Crowd (illustrated) or automatic cable crowd.

•

VERSATILITY: Easily convertible, and equally efficient as a crane, dragline, clamshell, shovel, backdigger, skimmer-scoop.

PERFORMANCE

1200 Yds. in 10 Hours!

That's the yardage for this ¾-yd. Lorain-40A of the Smith Construction Company. The shovel is digging and loading creek bed sand and gravel for a highway job in Lincoln County, W. Va.

And here are a few more reports from Lorain-40A owners—

2508 yds. in 13 hrs.!
1600 yds. in 12 hrs.!
1800 yds. in 12 hrs.!

Sure, these are top yardages but they show what this ¾-yd. machine can do under pressure.

YOU'VE GOT A BUY

• The Lorain-40A is one ¾-yd. machine that can lay both design facts and performance figures on the line to prove its ability to move more material, faster, at lower cost. The complete story may be had by writing

UNIVERSAL CRANE DIVISION • THE THEW SHOVEL COMPANY • LORAIN, OHIO

THEW CENTER DRIVE

¾-YD. LORAIN-40A

A reinforcing steel expert

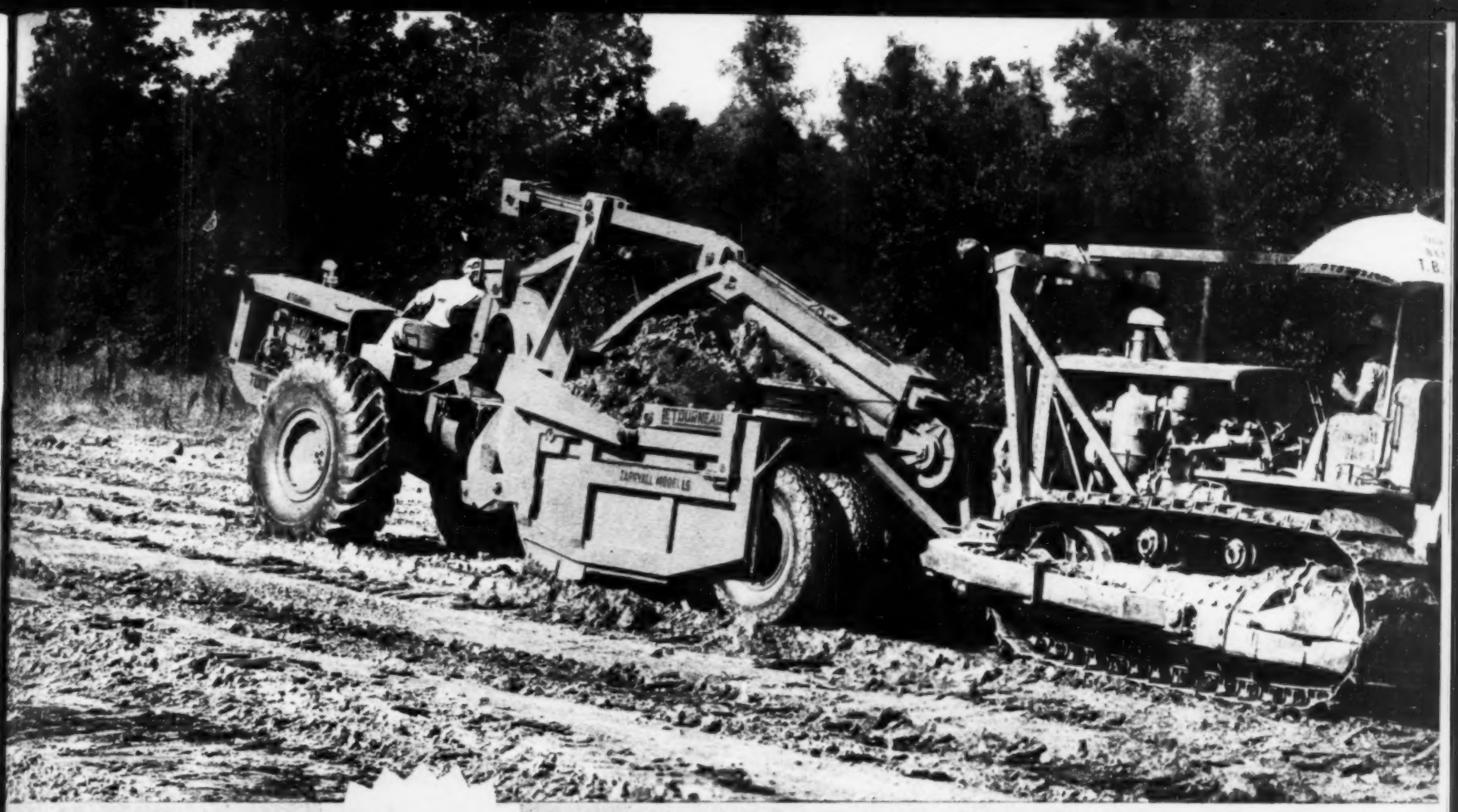
IN EVERY SALES OFFICE

In each of Bethlehem's sales offices there are one or more men who have been intimately associated with every kind of reinforced concrete construction. These men are technically trained experts on reinforcing steel. With a full understanding of your problems they can give the complete and intelligent service you need.

To further this reinforcing steel service Bethlehem maintains 15 warehouses in key industrial areas; the one nearest your job can ship your steel economically. In addition, each Bethlehem warehouse has a shop staffed and equipped to cut, bend and fabricate the steel according to your specifications.

BETHLEHEM STEEL COMPANY

BETHLEHEM STEEL



Pay Dirt 72 cu. yds. PER TOURNAPULL HOUR
Haul . . . 6300 ft. ROUND TRIP

When D. B. Hill, long time LeTourneau fleet user, began building a bridge approach on U. S. 64, nine miles out of Wynne, Arkansas, he decided to try today's new, faster way of earth-moving—the TOURNAPULL METHOD. Two Model C Tournapulls with LS Carryalls (11 heaped yards) moved to the job.

Average 11.1 miles per Hour

In wet, sticky gumbo, these 2 rigs averaged 8 pay yards per load, delivered 899 loads or 7,192 cu. yds. in 100 Tournapull hours on a 6300-foot round trip haul! Average travel speed was 11.1 miles per hour! Even with loading and spreading time included average was 10.78 m.p.h.

Investigate This Fast, Profitable Way of Moving Long-Haul Yardage

Like D. B. Hill, and scores of other alert contractors, you can extend LeTourneau Carryall savings to long hauls by using fast-moving self-propelled Tournapull rigs. You'll get heaping loads quickly with a pusher, you'll haul those big loads at truck speeds and spread them on the fill in even layers just as all LeTourneau Carryalls do. You'll save money because there's no need for extra, costly loading or spreading equipment—Tournapulls dig, haul and spread. No other rigs available today move so much yardage so fast and cheaply.

Try It on Your Own Job

See for yourself what they can do. Ask your LeTourneau-"Caterpillar" dealer to show you NOW . . . on your own long-haul job . . . how Tournapulls can speed earthmoving and put extra profits in your pocket.

ACTUAL JOB DATA

. . . certified by our Field Engineering Dept. You are invited to call on this Dept. for aid in estimating and planning the best methods of handling your earthmoving problems.

Operation Quickly Learned — Production figures given here were obtained with operators who had less than a week's Tournapull experience. Tournapulls use the same Power Control Units that make load-ing and spreading so simple with tractor-drawn Carryalls. Shifting and steering are similar to tractor operation.

GOOD HAUL ROADS - D.B. HILL IS A FIRM BELIEVER IN WELL MAINTAINED HAUL ROADS, THUS IS ABLE TO KEEP ALL HAUL-ING RIGS MOVING AT THERE MOST PROFITABLE SPEEDS.

LETOURNEAU

PEORIA, ILLINOIS • STOCKTON, CALIFORNIA

CARRYALL* SCRAPERS, ANGLEDOZERS,* BULLDOZERS, ROOTERS,* POWER CONTROL UNITS, DRAG SCRAPERS, CRANES, PUSHDOZERS, SHEEP'S FOOT ROLLERS, TOURNAPULLS,* TOURNATRAILERS*

* Name Reg. U. S. Pat. Off.

Cable address:
"BOBLETORNO"

★ PREPARE

National Defense Awards with

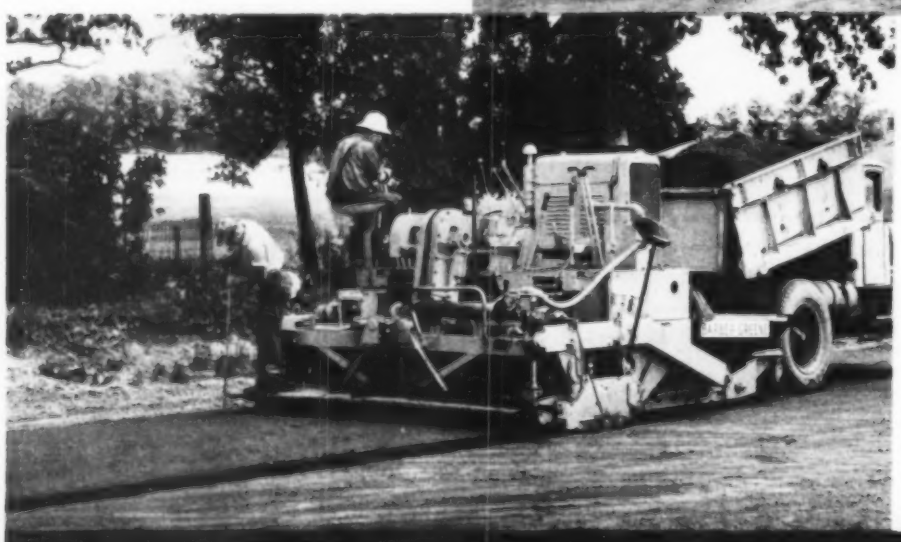
★ *Getting the correct modern equipment may become the "neck of the bottle" on National Defense jobs. Get your files up-to-date with complete information on these up-to-the-minute Barber-Greenes.*

TRAVEL PLANTS

The Barber-Greene Travel Plant accurately proportions, thoroughly mixes, and speedily completes the job at a rate that means the finest quality for the smallest cost. Easily converted to a Central Plant, it handles any type of bituminous or stabilizing job.

CENTRAL PLANTS

The Barber-Greene Central Plant has established new standards in portability and easy set-ups. Available for single or multiple aggregates, its accuracy and high capacity have been eye-openers to every bituminous man who has seen it in operation.



FINISHERS

The Barber-Greene Tamping-Leveling Finisher continues to lay the road by which other jobs are judged. In spite of its low cost operation, the level, uniformly compacted Barber-Greene mat is in a class by itself for excellence and permanence.

B STANDARDIZED MATERIAL HANDLING MACHINES G

BARBER-

YOURSELF *for*
complete Barber-Greene Information

DITCHERS

The milling action digging and Vertical Boom principle of the Barber-Greene Ditcher give it a great advantage whether it's cutting hard formations, or high speed cross country work. Available in three models, it gives the most economical ditching up to 8'3" deep and 24" wide.

LOADERS

There isn't any way of loading material from stockpiles to trucks as cheaply as with a Barber-Greene Bucket Loader. This together with its many other uses, screening, light excavating, etc., make it a useful tool on every job.

CONVEYORS

Barber-Greene Belt Conveyors are built for contracting, for frequent set-ups, knock-downs, and rearrangements. Their Standardized Sectional Construction is available to the contractor. Portable or permanent in any desired length.

Mail today . . . . . .

Just clip this coupon to your letterhead and check the items on which you would like complete information. There is a booklet on each subject. No obligation.

☐ MIXERS ☐ LOADERS
☐ FINISHERS ☐ CONVEYORS PORTABLE
☐ DITCHERS ☐ CONVEYORS PERMANENT

40 15 Barber-Greene Company, Aurora, Illinois

BARBER-GREENE

STANDARDIZED MATERIAL HANDLING MACHINES

STANDARDIZE...

SIMPLIFY AND SAVE

...WITH "CATERPILLAR" DIESEL EQUIPMENT

If you want to see pay-dirt fly, watch an outfit like this at work: A "Caterpillar" Diesel D8 Tractor with a LeTourneau Carryall Scraper. This is one of nine "Caterpillar" Diesel Tractors — along with the "Caterpillar" Diesel No. 12 Motor Grader shown in the other photograph — used by the McCarthy Improvement Co. on the relocation of Highway 66 near Bloomington, Ill.

THERE are good reasons why so many successful contractors find that it pays to standardize on "Caterpillar" Diesel power-equipment.

Here's one, by E. J. Fraser, superintendent for the McCarthy Improvement Co., of Davenport, Iowa: "By standardizing on 'Caterpillar' Diesels, we have gone a long way toward simplifying servicing and operation. Our operators and mechanics are equally at home on any machine on the job."

With mechanics who know how to keep all machines in good working condition, and operators who know how to get the most work-per-hour out of them, Mr. Fraser finds that "we have stepped up our production and shortened our down-time."

But that isn't all. Mr. Fraser adds: "And . . . our experience has proved that 'Caterpillar' Diesels need less servicing and can be serviced quicker than other machines. Parts and service facilities are always handy wherever we go."

In other words, when you *do* need parts or service, nothing could be more simple or convenient than getting *all* such requirements—for *all* your power—from *one* nearby source! ("Caterpillar" parts-and-service facilities are the most complete and wide-spread of their kind in the world.) Fuel supply, too, becomes a simplified matter . . . one kind, one grade, one source can fill *all* your needs when "Caterpillar" Diesel powers "the whole works."

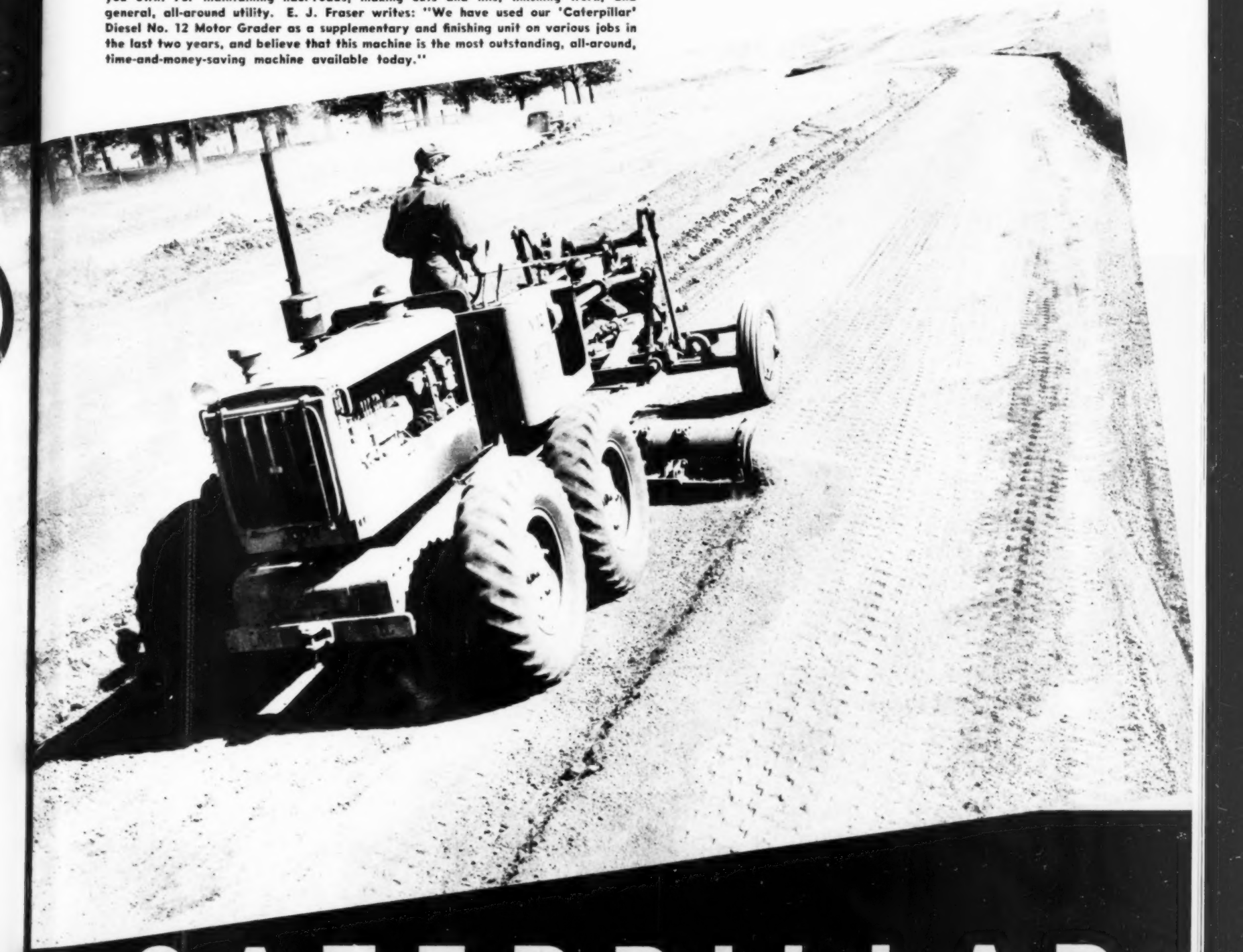
Let your "Caterpillar" dealer show you the complete present-day "Caterpillar" Diesel line. Explain your requirements and let him help you pick out the outfits best suited for *your* jobs. Or, write direct to the factory.

•

CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS

AN ALL-AROUND MACHINE FOR ALL AROUND THE JOB!

Fast, efficient, versatile, economical and dependable. *That's* the "Caterpillar" Diesel Motor Grader — and you'll probably use it more than any other machine you own: For maintaining haul-roads, making cuts and fills, finishing work, and general, all-around utility. E. J. Fraser writes: "We have used our 'Caterpillar' Diesel No. 12 Motor Grader as a supplementary and finishing unit on various jobs in the last two years, and believe that this machine is the most outstanding, all-around, time-and-money-saving machine available today."



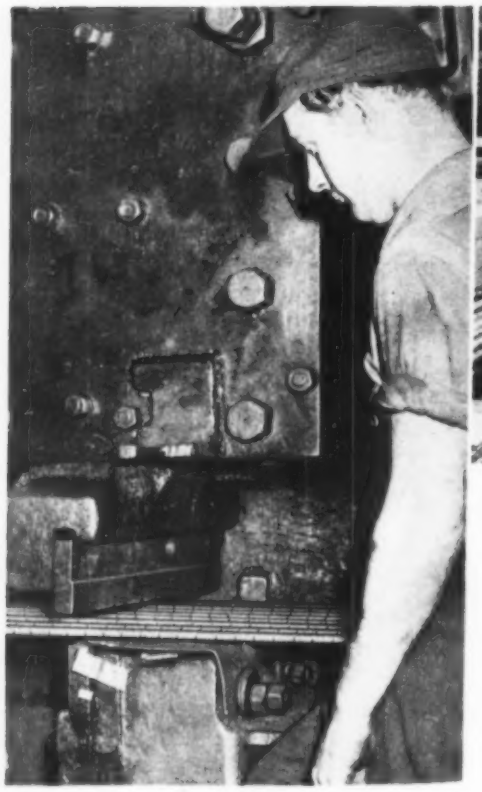
CATERPILLAR

REG. U.S. PAT. OFF.

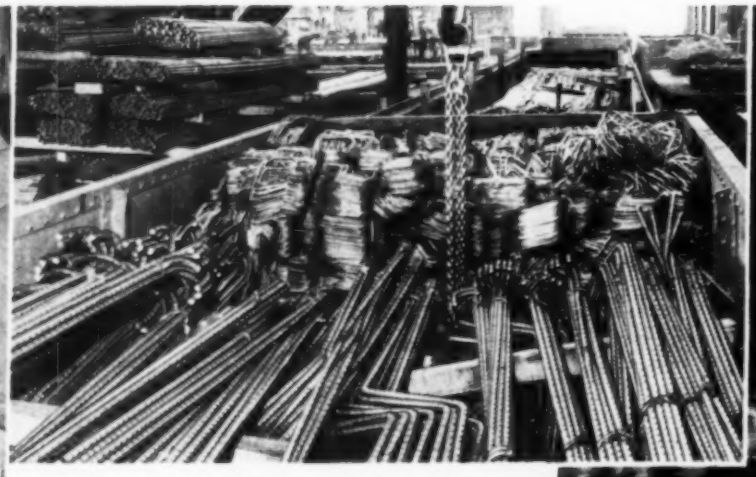
DIESEL ENGINES and ELECTRIC SETS • TRACK-TYPE TRACTORS • ROAD MACHINERY

Any Size . . . Any Shape . . . Anywhere

— *On time!*

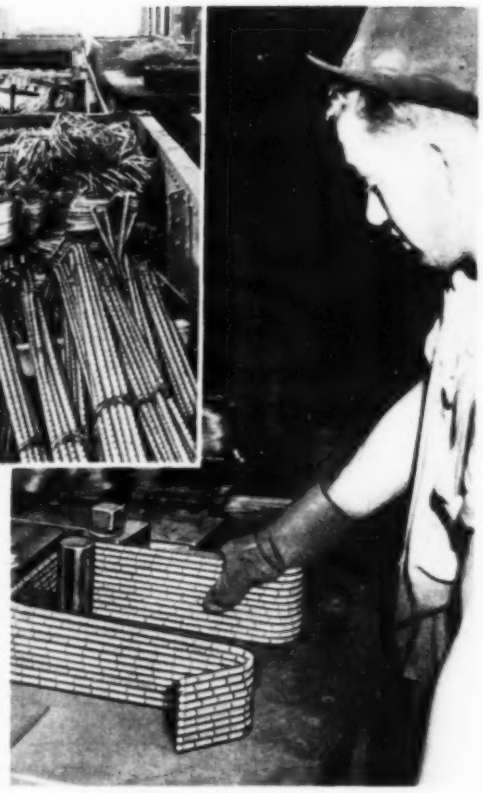


Bars can be furnished in standard sizes and cut to any length. Ample stocks and modern equipment assure prompt service.

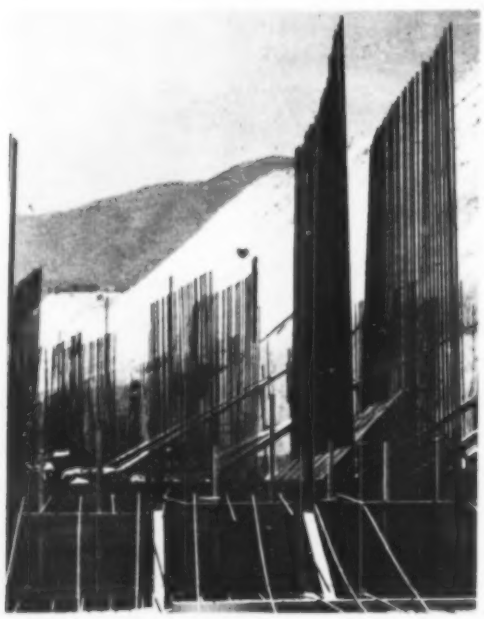


Full stocks of all standard bars are always on hand. Your orders can be filled and delivered on short notice.

Order bars that bear the symbol of the Concrete Reinforcing Steel Institute. This symbol assures you quality bars, of domestic manufacture, rolled from new billet steel.



Bars can be supplied in any shape desired. Bending is done to your specifications before delivery.



LET'S get right down to *why* U·S·S Concrete Reinforcing Bars are your best buy—why they meet your every demand.

First, you are always near a U·S·S distributor who carries an ample stock of all standard sizes. No matter where your job is, you can get bars in a hurry.

Second, should you want any cutting or bending, it can be done to your specifications before delivery. We are equipped to turn out bars promptly, in any shape.

Finally, U·S·S Concrete Reinforcing Bars carry double proof of value. They are a U·S·S product—a name that stands for high quality in steel everywhere. And every bar bears the Quality Symbol of the Concrete Reinforcing Steel Institute. That is your guarantee that it is full size, cleanly rolled from *new* billet steel to standard specifications, and of domestic manufacture.

It is worth money to have a dependable source of supply. On your next job specify U·S·S.

U·S·S CONCRETE REINFORCING BARS

Manufactured by

CARNEGIE-ILLINOIS STEEL CORPORATION, *Pittsburgh and Chicago*
COLUMBIA STEEL COMPANY, *San Francisco*
TENNESSEE COAL, IRON & RAILROAD COMPANY, *Birmingham*
United States Steel Export Company, New York

UNITED STATES STEEL

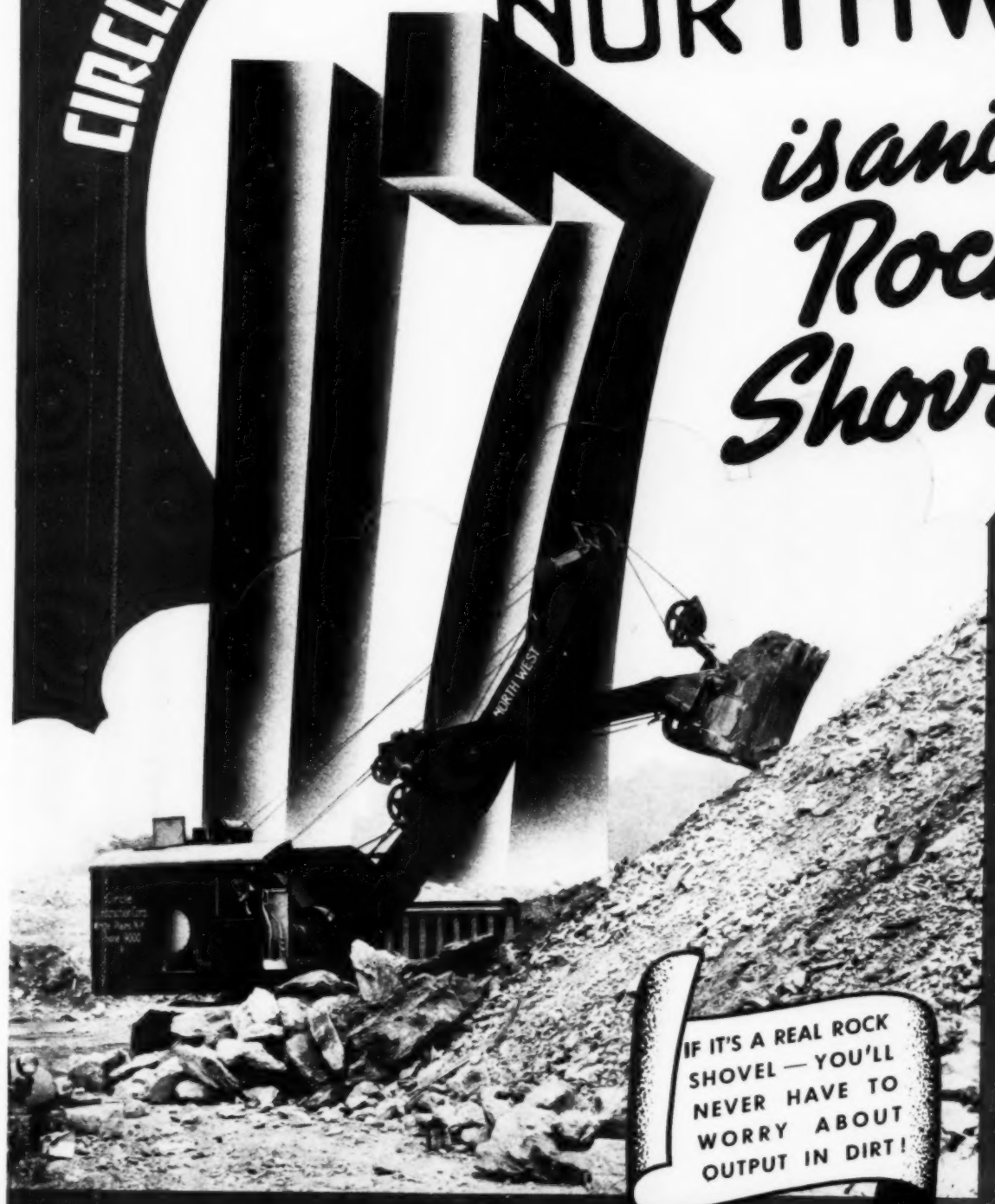
CIRCLE CONSTRUCTION CORP.'S

Seventeenth

NORTHWEST

is another

Rock Shovel



IF IT'S A REAL ROCK SHOVEL — YOU'LL NEVER HAVE TO WORRY ABOUT OUTPUT IN DIRT!

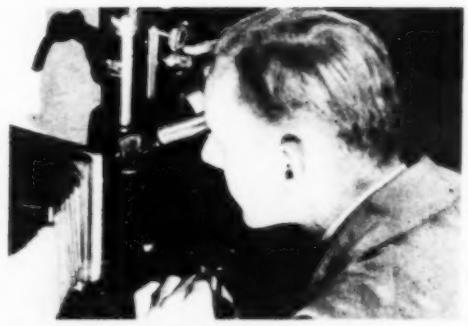
CAN there be anything more convincing than this to prove the quality of Northwest performance — a seventeenth Northwest — a *sixteenth repeat order*—and for another New York Rock Job. You can't overlook repeat orders of Northwests for rock jobs! If you have a *real* rock shovel you never have to worry about output in dirt.

NORTHWEST ENGINEERING CO.
1728 Steger Building
28 E. Jackson Blvd.
Chicago, Illinois

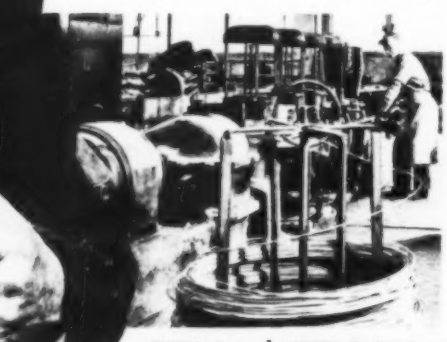
Shovels • Cranes • Draglines • Pullshovels • Skimmers

"The BETTER it's tailored the LONGER it wears!"

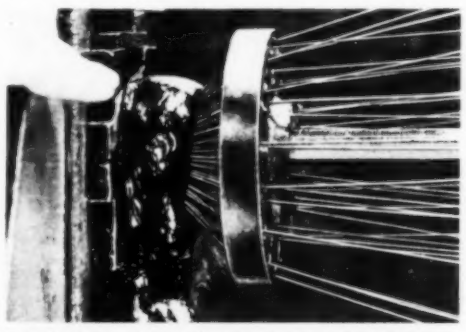
If you keep performance records on both ordinary wire rope and Macwhyte Steel-tailored rope, you'll actually SEE (as you can here): how Macwhyte steel-tailored rope outlasts ordinary rope by a *wide* margin. Let me show you why:



FIRST, there's DESIGN Tailoring. Macwhyte men are *specialists* with years of experience in the laboratory . . . the ropes they make are designed to meet your *specific* problems. That's why Macwhyte Ropes LAST so long, why they're so profitable to use.



THEN there's STEEL Tailoring. The steel used in Macwhyte ropes is not ordinary steel. And every process through which it goes... laboratory tests, heat-treating, baking, wire drawing . . . is done with hair-line accuracy by master workmen.



FINALLY, there's PERFECT FITTING — exact, synchronized strand FITS PERFECTLY and is FULLY PROTECTED in the finished rope by special Macwhyte lubricant, specially designed to ward off corrosion and internal friction.

BUT THAT ISN'T ALL! Macwhyte engineers the year 'round check performance on *all* kinds of jobs. They find out what rope does best on a specific job. That's why they can recommend for your specific job a rope designed, made, and field-proved to give you maximum service. In short, Macwhyte wire rope is "steel-tailored" to give you longer wear at considerably less cost. Try it.

NO. 442A

MACWHYTE COMPANY

Kenosha, Wisconsin; Manufacturers of Wire Ropes and Braided Wire Rope Slings for every use. (Distributors throughout the U. S. A.) New York... Pittsburgh . . . Chicago . . . Ft. Worth ...Portland...Seattle...San Francisco.

MACWHYTE

Whyte Strand

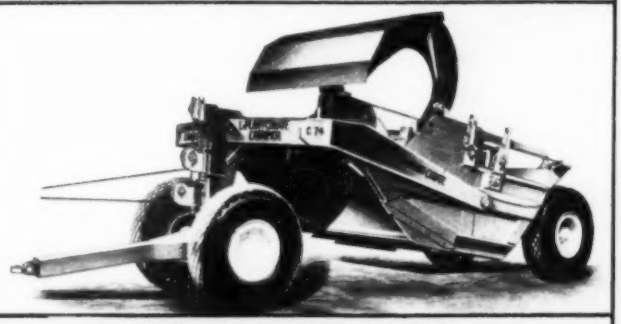
PREformed WIRE ROPE

The Wire Rope with THE Internal Lubrication

LABORATORY TESTED—FIELD PROVED

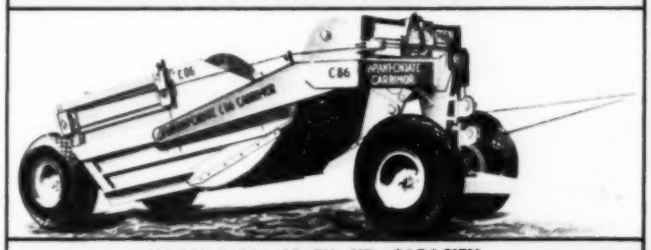
Exclusive Features Better Performance Bigger "Pay Loads"

A Model For Every Need

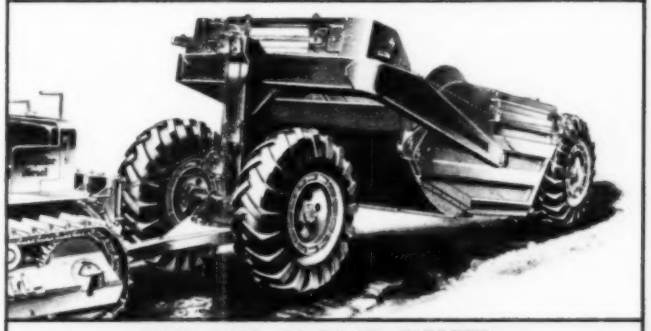


MODEL C-74 12 CU. YD. CAPACITY

MODEL C-84 16.5 CU. YD. CAPACITY



MODEL C-86 19 CU. YD. CAPACITY



MODEL C-104 33 CU. YD. CAPACITY

LAPLANT-CHOATE CARRIMOR

Positive Ejection Type Scrapers

Here's a highly versatile piece of equipment that you can keep busy . . . *profitably* busy on any job requiring regular scraper operations, loading, hauling and dumping. And time after time, a LaPlant-Choate Carrimor Scraper eliminates the trouble and expense of bringing extra hauling equipment into use. Why? Because the Carrimor has *no overhead obstruction* — thus you can load direct from a shovel when necessary and haul and dump the rock or other material in fewer trips and at low cost.

Yes, you can handle more material in fewer trips because these big Forced Ejection Type Scrapers have extra *capacity!* And they are so highly mobile that they roll easily and dependably even under the toughest conditions. These Carrimors are so skillfully engineered and perfectly balanced that *only four wheels* are required to handle any load. There is a real saving in maintenance expense.

Here are but a few Carrimor features. See how they dovetail into your operating needs: low center of gravity for side slope work . . . positive ejection of *all* material . . . no internal obstructions in the bowl . . . high clearance . . . close coupled . . . wheels are inside of cut at all times . . . 3-section reversible cutting edges . . . large opening front apron controlled for positive closing . . . moveable rear gate cleans bowl completely on each dump . . . and many others.

Available in 4 sizes as illustrated. Designed for use with "Caterpillar" Track-type tractors. Your nearest LaPlant-Choate and "Caterpillar" dealer can give you full details. Write, wire or call today.

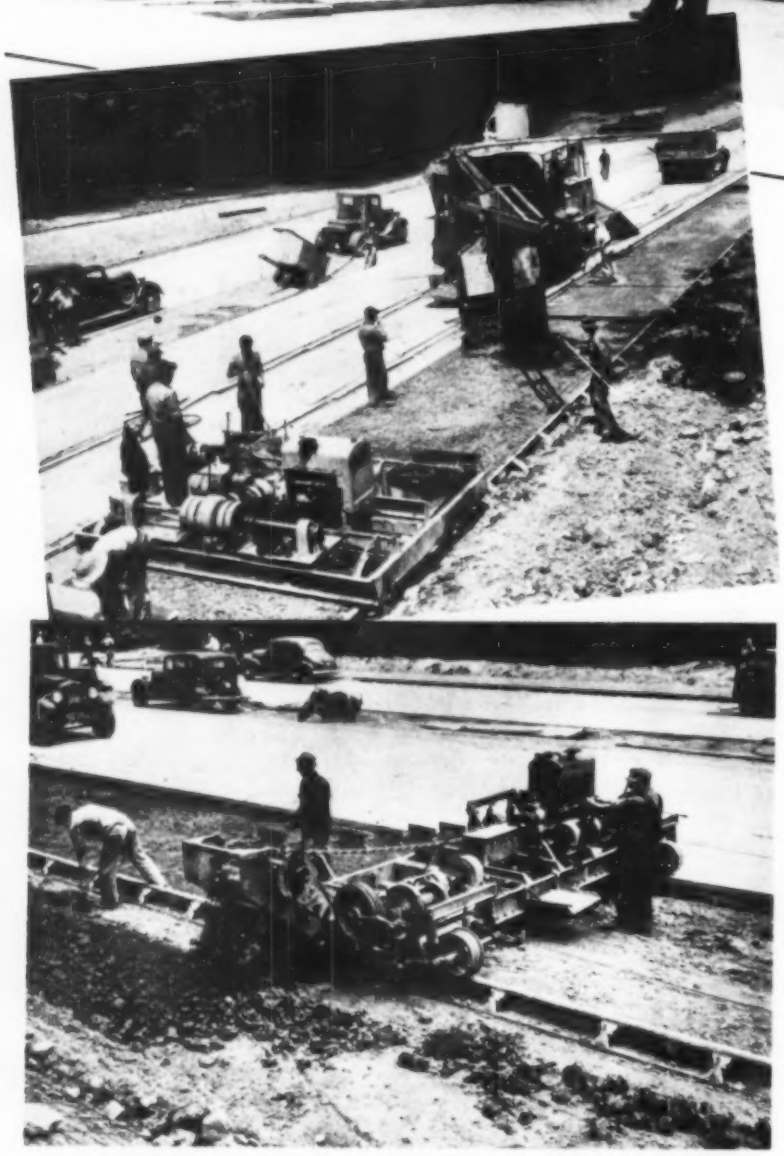
LAPLANT-CHOATE MANUFACTURING CO. Inc.

CEDAR RAPIDS, IOWA.

"We stepped up the efficiency of all of our equipment by using GULF'S HIGHER QUALITY LUBRICANTS"

. . . says Turnpike Contractor

At the left are typical scenes of equipment used by the States Engineering Company on their Pennsylvania Turnpike paving contract. Gulf quality lubricants and fuel helped them to complete a long stretch on schedule.



States Engineering Company of Harrisburg, Pa. and Rapid City, South Dakota, paved approximately 5 miles of the Pennsylvania Turnpike in Franklin and Cumberland Counties. They operate the most modern paving equipment available. To keep this costly machinery in top-notch operating condition, they standardized on Gulf quality lubricants and fuels.

"We followed the Gulf Engineer's Recommendations and avoided machinery breakdowns"

"WE standardized on Gulf quality lubricants to get the utmost efficiency from our equipment on this job," says this contractor. "Working against time meant that we had to be sure of continuous operation. Gulf's higher quality lubricants and the practical assistance of the Gulf lubrication engineer gave us that assurance."

Call in the Gulf engineer before you start your next big job—he can help you get extra hours of trouble-free operation, at no additional cost. Gulf's higher quality lubricants are quickly available, no matter where your job is located, from 1,100 strategically located warehouses in 30 states, from Maine to New Mexico. 'Phone or write your nearest Gulf office today!

GULF

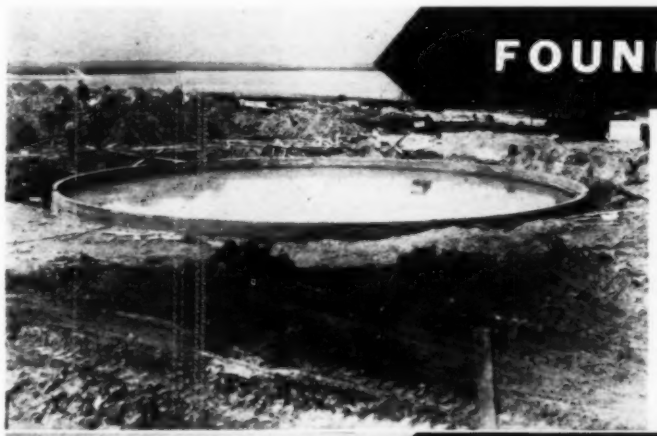
Save days and dollars

ON ALL KINDS OF JOBS

WITH ATLAS HIGH-EARLY CEMENT!

THE three jobs below show how many a concreting job can be done quicker, and frequently at less cost, with Atlas High-Early cement! That's because concrete made with Atlas High-Early gains strength rapidly. It is ready for its load often within 24 hours of placing. This may cut down labor and overhead cost; cut curing and protection time costs to less than half. Also it often allows earlier stripping and re-use of forms, cutting down the number of sets needed.

So try Atlas High-Early cement on your next job. You'll find it often pays back its slightly higher cost—over and over again! Universal Atlas Cement Co. (United States Steel Corporation Subsidiary), Chrysler Building, N. Y. C.



FOUNDATIONS—12 DAYS SAVED!

Tank foundations built for Rayonier Inc., paper mill in Fernandina, Fla., with Atlas High-Early cement. Concrete placed in both tanks in one continuous operation. Placing took, in first foundation, about 5 hours; in second, about 8 hours. Use of Atlas High-Early saved 6 days on each foundation. Engineer, Central Engineering Co., Port Angeles, Washington; Contractors, Rust Engineering Co., Pittsburgh, Pa.

BRIDGE—9 DAYS SAVED!

Reinforced concrete county bridge in Schuylkill County, Pennsylvania. Original specifications called for removal of forms in 14 days. But, by using Atlas High-Early cement in parapet, deck, and one span, forms were removed in 5 days. Altogether, 9 days were saved and form costs were cut by using Atlas High-Early. Engineer, Robert L. Schenck, Court House, Pottsville; General Contractor, C. L. Miller, Pottsville; Sub-Contractor, John Starr, Herndon, Pa.

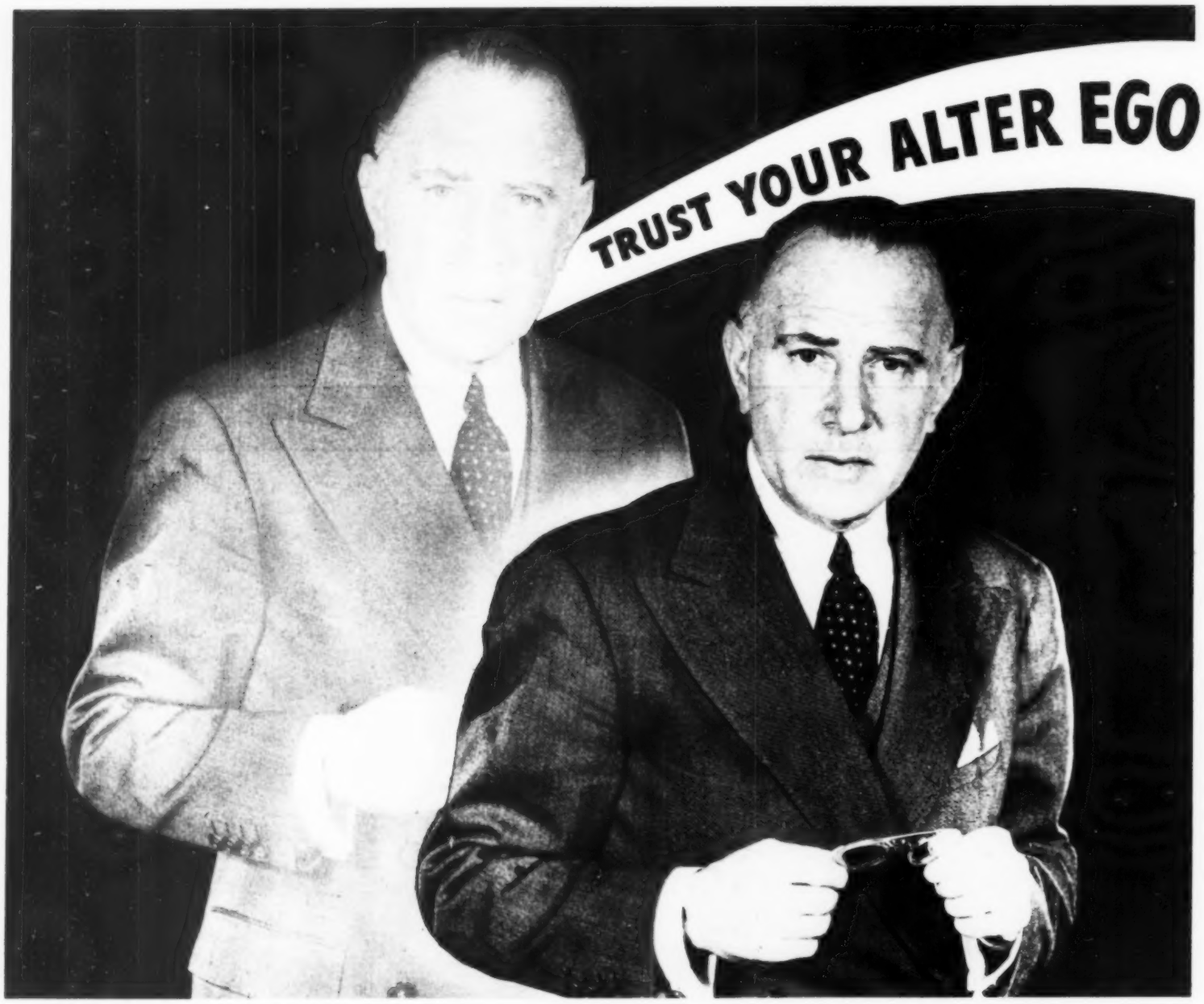
PILES—10 DAYS SAVED!

Piles for foundation of East Street Sludge Disposal Plant, New Haven, Conn. Filling driven pile shells with standard portland cement concrete would have meant holding up nearby drilling until concrete could stand vibration. But—by using Atlas High-Early concrete—piles could be driven close by *the next day!* This saved 10 days on a 20-day job, and $200 on curing costs. Consulting Engineer, George B. Gascoigne, N. Y.; Acting Director, W. Vincent Barry, Dept. of Public Works, New Haven; Contractor, New Haven Road Construction Co., Inc.

CM-H-11

ATLAS HIGH-EARLY CEMENT

A UNIVERSAL ATLAS PRODUCT



ALTER EGO: Literally "one's other self"—the still, small voice that questions, inspires and corrects our conscious action.

ALTER EGO: Let's talk things over. As your other self, I feel it my duty to give you some advice on how to improve your product and cut its cost.

Well, you're one fellow I don't mind getting advice from. I know you *won't try to sell me something.*

ALTER EGO: All right. Here's my suggestion. First, improve your reasoning technique. Learn to *trust your Alter Ego*. Listen to that inner voice more often.

All right, but I've had to use my conscious mind so much to ward off exposure to arc welding salesmen that I've got in the habit of trusting my surface judgment.

ALTER EGO: Yes, and because of surface reasoning you're too prone to deride that which you don't sufficiently understand. Look how others are profiting with arc welding.

But how can I understand arc welding without opening up to sales exposure?

ALTER EGO: I understand that Lincoln is a good source for arc welding information that's devoid of your pet aversion. Not a high-pressure sales talk in a book-full.

• •

LINCOLN SUGGESTS: To acquaint yourself with Structural Welding, why not obtain a factual, informative discussion of this construction method? Lincoln has a series of bulletins which suggests how to design for strong, rigid, light-weight welded construction. Why not write for them?

LINCOLN "SHIELD-ARC" WELDING
THE LINCOLN ELECTRIC COMPANY
Cleveland, Ohio
Authoritative Information on Design • Production • Welding Equipment

A FAST and POWERFUL

Machine for Heavy Duty Digging Service

The MARION
Full Capacity
2½ Cu. Yd. Shovel

Simple arrangement of machinery . . . balanced design
Swing and travel by air control
Air controlled dipper trip
"Live" roller circle for even load distribution
Self-cleaning, non-clogging crawlers . . . manganese pads
MODERNIZE with MARION

From crawler pads to dipper teeth, the MARION Type 392 - 2½ cu. yd. machine is a modern, powerful and thoroughly reliable digging tool. The features listed above account for its exceptional operating efficiency. Its balanced design, sturdy construction and oversize power plant give this MARION the necessary speed and stamina to cut digging costs in rock, shale and clay as well as in dirt. It is yardage that counts. Write for bulletin describing this fast and powerful machine. » » » »

THE MARION STEAM SHOVEL COMPANY
Marion, Ohio, U. S. A.

SHOVELS • DRAGLINES • CLAMSHELLS • PULL-SHOVELS
CRANES • WALKERS • *from* ¾ cu. yd. to 35 cu. yds. • Gasoline • Diesel • Electric

Short Cut TO Economy

● Many a truck operator, after trying first one make then another, has standardized on Ford equipment. Others do it much sooner. They *start* with Ford Trucks and never change.

● If you're in the market for a new truck, take the short cut to economy. Get a Ford. And with it, get a brand-new idea of savings. Ask any Ford dealer to arrange an "on-the-job" test for you.

Ford

Here's Truck Value!

★ Choice of 2 improved V-8 engines — 85 or 95 hp.

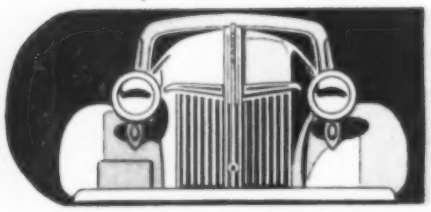
★ New 4-cylinder super-economy engine, optional in Commercial Cars and 122-inch trucks.

★ Beautiful modern styling—an important asset to your business.

★ Rugged, dependable full-floating rear axles in all trucks. ¾-floating in Commercial Cars.

★ Improved rear springs (main and auxiliary) on Regular and C.-O.-E. Trucks for heavy duty.

FOR '41 - PUT A FORD TO WORK!



1941 FORD TRUCKS

FORD MOTOR COMPANY, BUILDERS OF FORD V-8 AND MERCURY CARS, FORD TRUCKS, COMMERCIAL CARS, STATION WAGONS AND TRANSIT BUSES

It's TOUGH on Wire Rope... BUT HAZARD LAY-SET Preformed STANDS THE GAFF!

The above is a picture of the Pennsylvania Turnpike in the making. It is also a picture of Hazard LAY-SET Preformed *at work*. Such carryalls and bulldozers are tough on wire rope. That's why Hazard LAY-SET Preformed is a favorite with contractors. It stands the gaff!

And since Hazard LAY-SET Preformed can stand it here—certainly it will give greater dollar value on power shovels, draglines, skip hoists, cement mixers, car retarders and the thousand and one other applications where, actually, the work is easier.

Yes—Hazard LAY-SET Preformed lasts longer. That's because the preforming process eliminates all internal torsional stress; makes the rope flexible, easy to handle. LAY-SET resists kinking and snarling. Broken crown wires don't wicker out to jab workmen's hands. LAY-SET is a safer rope to handle. Specify Hazard LAY-SET Preformed Green Strand for your next line. All Hazard Ropes identified by the Green Strand are made of Improved Plow Steel.

Green Signifies Full Speed Ahead for National Preparedness

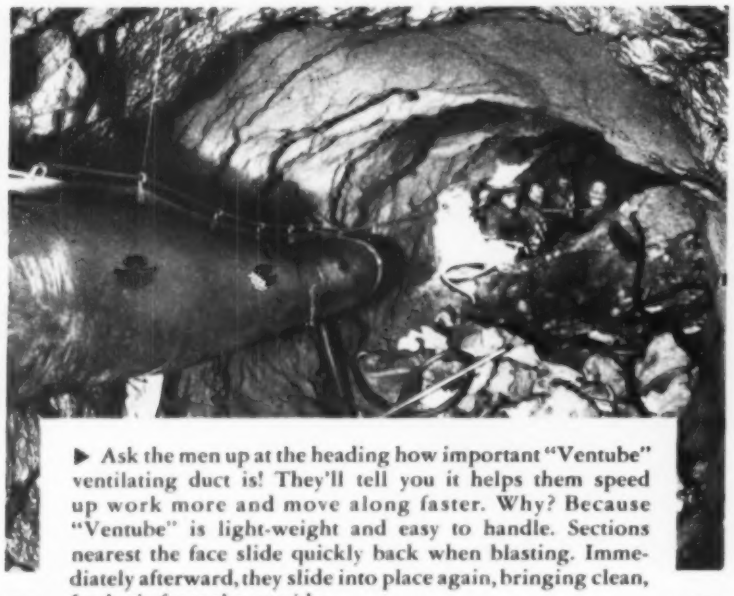
HAZARD WIRE ROPE DIVISION • WILKES-BARRE • PENNSYLVANIA

Established 1846

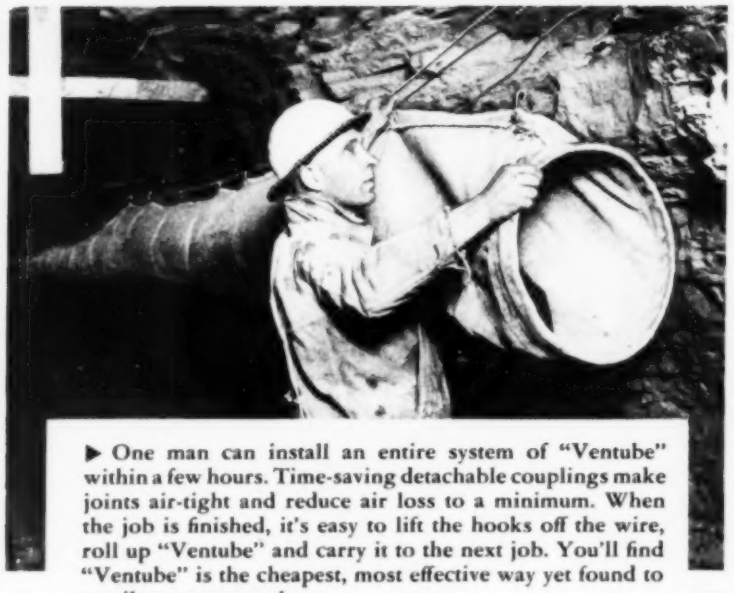
District Offices: New York, Chicago, Philadelphia, Pittsburgh, Fort Worth, San Francisco, Denver, Los Angeles, Atlanta, Tacoma

AMERICAN CHAIN & CABLE COMPANY, Inc.

YOU CAN'T BEAT VENTUBE* FOR LOW COST VENTILATION



▶ Ask the men up at the heading how important "Ventube" ventilating duct is! They'll tell you it helps them speed up work more and move along faster. Why? Because "Ventube" is light-weight and easy to handle. Sections nearest the face slide quickly back when blasting. Immediately afterward, they slide into place again, bringing clean, fresh air from the outside.



▶ One man can install an entire system of "Ventube" within a few hours. Time-saving detachable couplings make joints air-tight and reduce air loss to a minimum. When the job is finished, it's easy to lift the hooks off the wire, roll up "Ventube" and carry it to the next job. You'll find "Ventube" is the cheapest, most effective way yet found to ventilate your tunnel.

▶ All that is needed besides "Ventube" to insure best ventilating is a motor-driven fan of proper capacity. There's no expensive machinery to buy . . . No massive equipment to move from job to job. Notice how "Ventube" hangs as straight as a string. There are no kinks or bulges in the smooth interior to impede the flow of fresh air. And that holds true even when "Ventube" goes around corners and up and down steep inclines!

▶ "Ventube" is amazingly durable! It is made of extra-heavy, long-fibered cloth woven to high Du Pont standards. It's both coated and impregnated with a special composition that won't peel off. "Ventube" resists acid water, gases, fungus and moisture. And "Ventube" is made as strong in the warp direction as in the filler so it can resist tearing and rupture. Write Du Pont today for facts and figures on "Ventube."

Du Pont also makes powder bags

from the same sturdy, rubberized material as "Ventube" ventilating duct. They're compact but roomy—and available in several serviceable sizes. Write Du Pont for prices and complete information today.

**"Ventube" is Du Pont's reg. trademark for its flexible ventilating duct.*

• • •

TUNE IN "CAVALCADE OF AMERICA"... NBC RED NETWORK... EVERY WED.

DU PONT VENTUBE

THE FLEXIBLE VENTILATING DUCT

E. I. DU PONT DE NEMOURS & CO. (INC.)

"FABRIKOID" DIVISION, FAIRFIELD, CONNECTICUT

There's a BUCYRUS-ERIE SCRAPER FOR EVERY MAKE AND SIZE OF TRACTOR

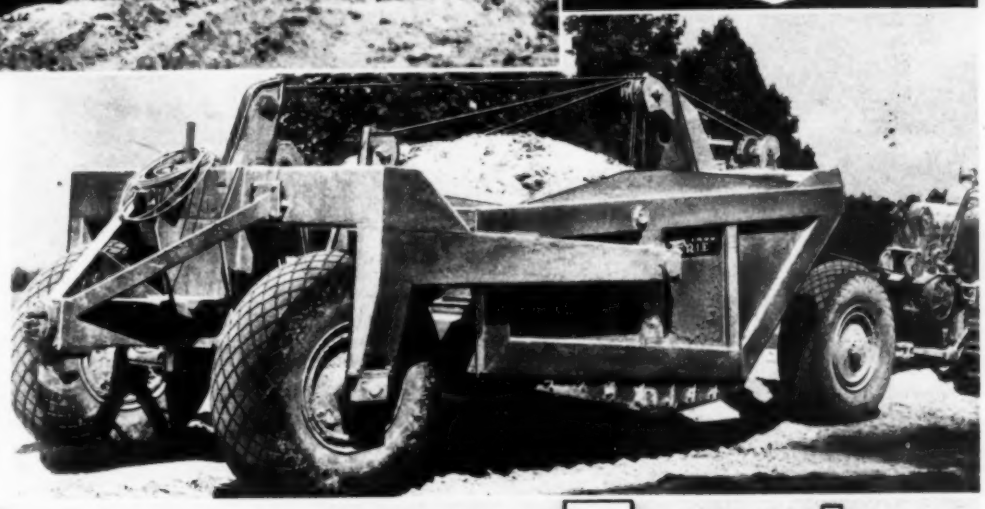
S-67
(6 cu. yds. struck capacity)
FOR 45-55 H. P. TRACTORS

S-45
(4 cu. yds. struck capacity)
FOR 35-45 H. P. TRACTORS

S-112
(10 cu. yds. struck capacity)
FOR 70-95 H. P. TRACTORS

S-90
(8 cu. yds. struck capacity)
FOR 65-75 H. P. TRACTORS

S-146
(13 cu. yds. struck capacity)
FOR 95 H. P. TRACTORS AND LARGER



You'll find these scrapers conservatively rated . . . by actual cubic content. Check them by measure, weight, or pay dirt. Know what you're getting; get what you pay for! Ask your International TracTracTor distributor for the fully illustrated 24-page bulletin that tells you how these scrapers increase output and cuts costs.

Bucyrus·Erie

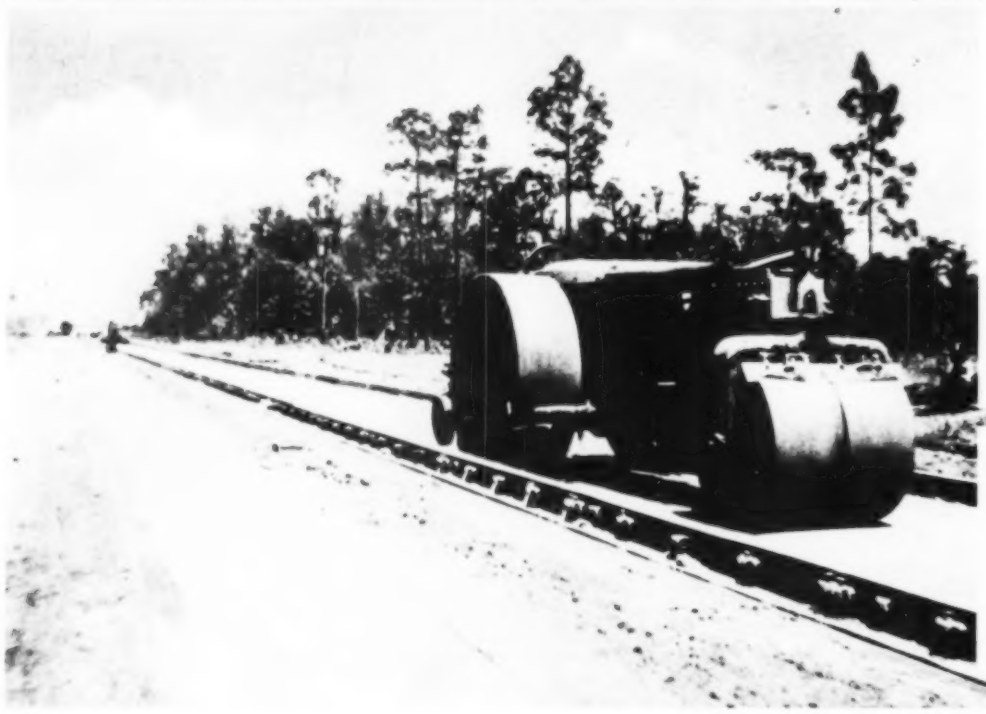
SOUTH MILWAUKEE, WISCONSIN

...SINCLAIR OPALINE and SINCLAIR PENNSYLVANIA motor oils and other Sinclair lubricants promote continuous operation and low maintenance costs under the toughest operating conditions. No matter what make or type of construction machinery you operate, you can get a Sinclair oil, grease or fuel that meets manufacturers' recommendations. Some 2,000 Sinclair agents in 41 states offer you reliable delivery service on all Sinclair lubricants or fuels. Just write the nearest Sinclair office or Sinclair Refining Company, 630 Fifth Avenue, New York, N. Y.

* * *

(left) **CONE BROS. CONTRACTING CO.** *(Tampa, Fla.) uses Sinclair products exclusively. Photo shows paving operation on Federal Highway from Taft (Fla.) to Osceola County line.*

Write for "The Service Factor", a free publication devoted to solution of lubrication problems.

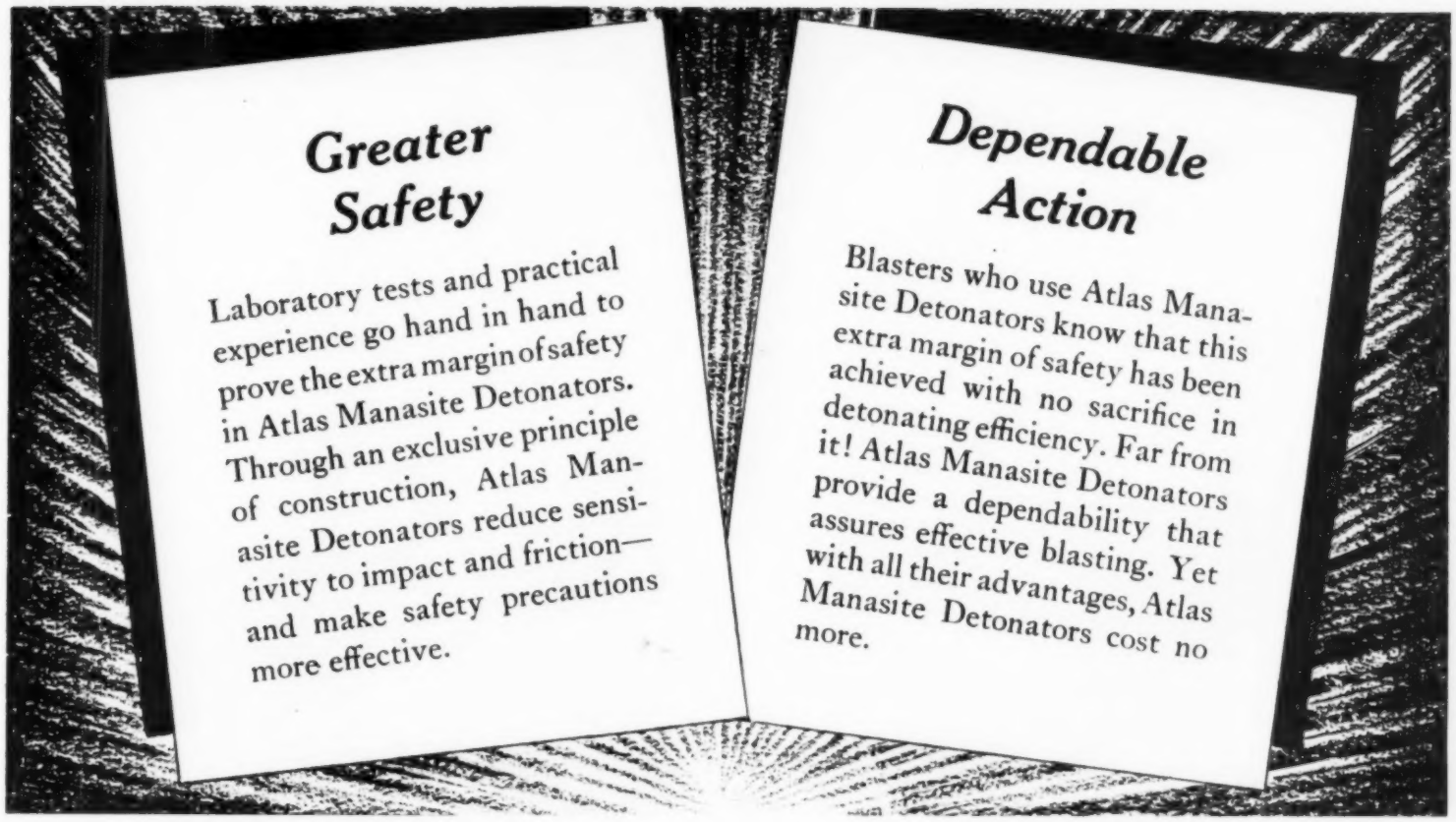


SINCLAIR REFINERIES are leaders in the development of *specialized lubricants* for the exacting requirements of modern equipment. For *road building machinery . . .*

SINCLAIR LUBRICANTS-FUELS

SINCLAIR REFINING COMPANY (Inc.)

2540 W. CERMAK RD. CHICAGO · 10 W. 51ST ST. NEW YORK · 1907 GRAND AVE. KANSAS CITY · 573 W. PEACHTREE ST. ATLANTA · FAIR BUILDING, FT. WORTH

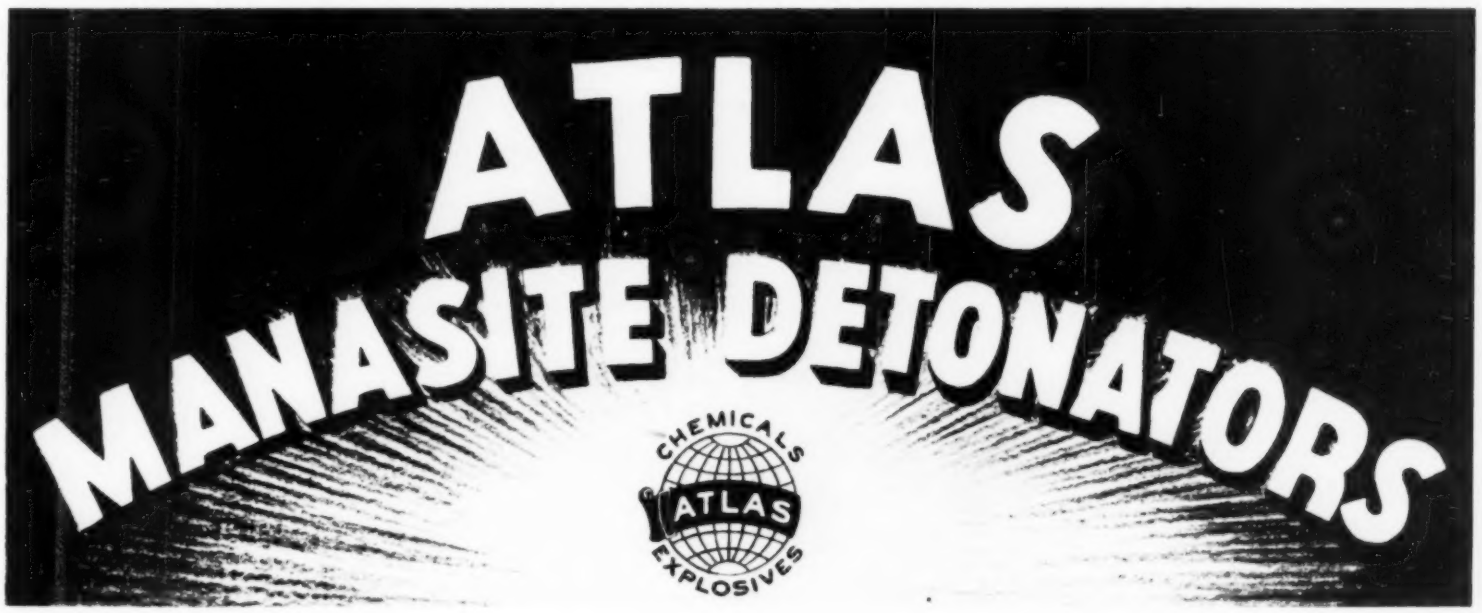

Greater Safety
Laboratory tests and practical experience go hand in hand to prove the extra margin of safety in Atlas Manasite Detonators. Through an exclusive principle of construction, Atlas Manasite Detonators reduce sensitivity to impact and friction—and make safety precautions more effective.
Dependable Action
Blasters who use Atlas Manasite Detonators know that this extra margin of safety has been achieved with no sacrifice in detonating efficiency. Far from it! Atlas Manasite Detonators provide a dependability that assures effective blasting. Yet with all their advantages, Atlas Manasite Detonators cost no more.

Here's the Proof—

Over Eighty Million Atlas Manasite Detonators Already Have Been Used

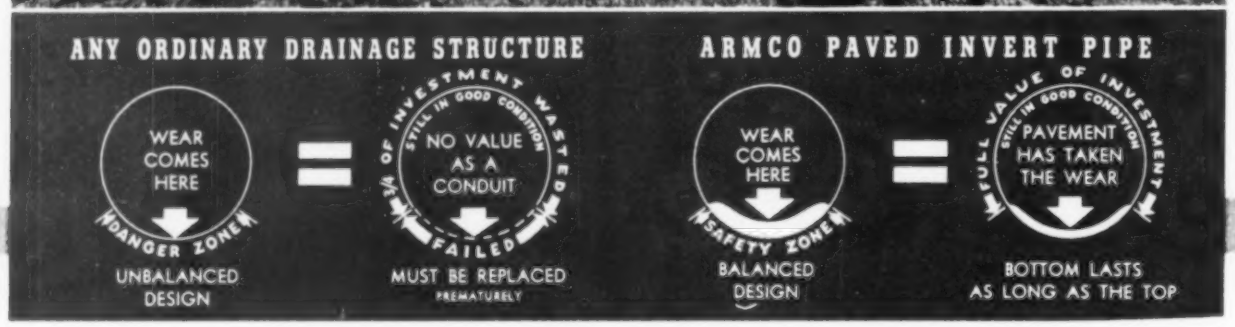
Everything for Blasting

ATLAS POWDER COMPANY, WILMINGTON, DEL.



Those culverts you Bought

But never used...?



This may never have occurred to you, but the next time you replace a worn-out culvert look at the top. If the culvert has held up as a structure you'll generally find that the upper three-fourths of it remains in good condition. This is the part you have paid for but must now throw away.

Inspections show that the bottom of *any* drainage structure is the part that gets the wear. This is why ARMCO engineers developed the balanced design of ARMCO Paved Invert Pipe. A thick, smooth bituminous pavement protects where the wear comes and makes the bottom endure as well as the top. Therefore your culverts last longer, cost less per year of service, and you get full value out of the investment.

For extreme corrosive conditions you can get ARMCO Paved Pipe fully coated for even greater permanence. This special bituminous coating is inseparably bonded to the pipe by ARMCO's Asbestos-Bonding process and adds years of service. Write us for complete data. ARMCO DRAINAGE PRODUCTS ASSOCIATION, Middletown, Ohio.

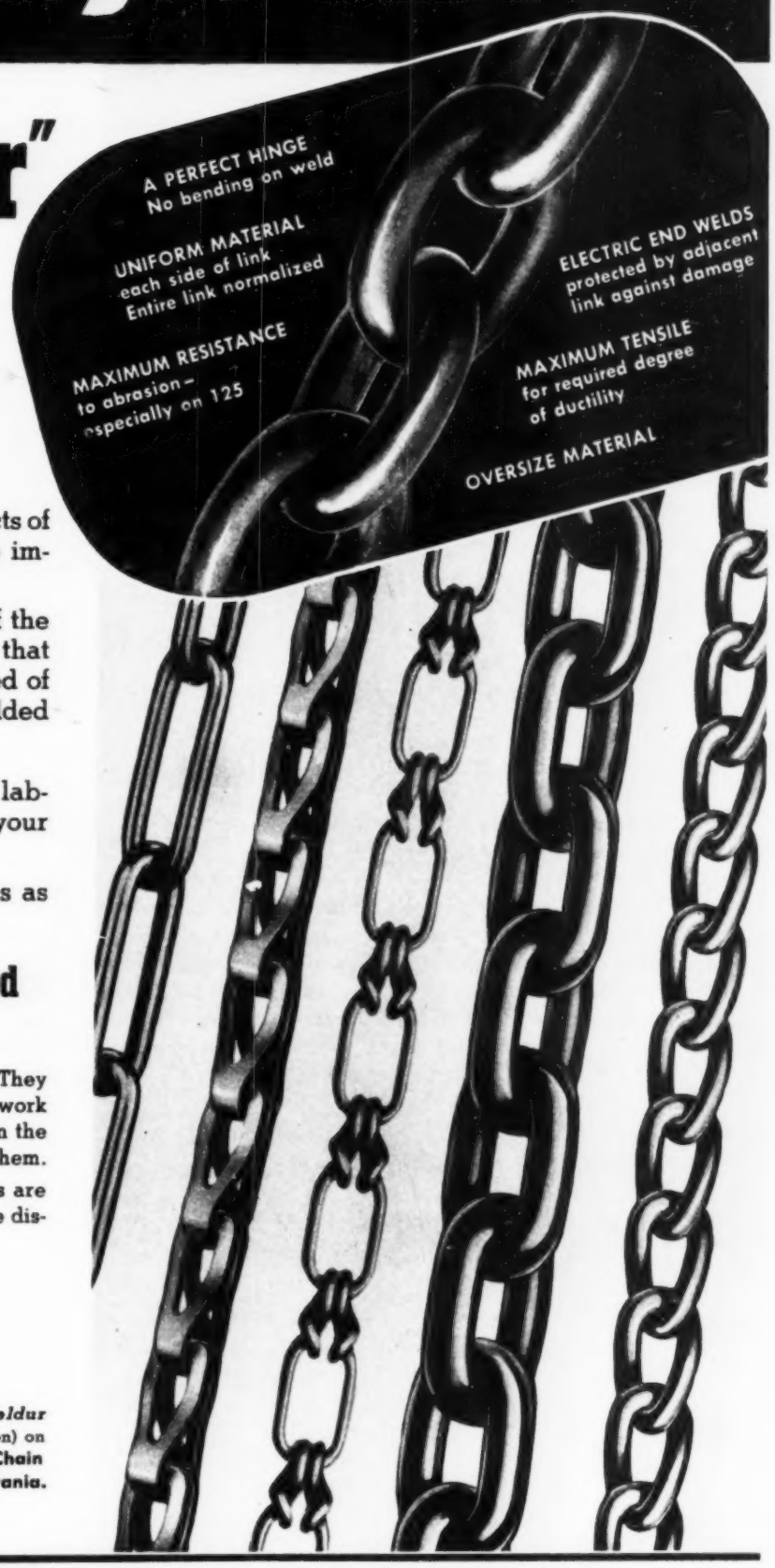
Armco ARMCO **PAVED INVERT PIPE**

A PRODUCT ORIGINATED AND DEVELOPED BY ARMCO ENGINEERS

4 to 1 Longer Service

"Endweldur"

Brings You These Important Advantages in Sling Chain



ENDWELDUR Sling Chains withstand the effects of elevated and sub-zero temperature, of moderate impact loadings and of bending and gouging.

The welding of each link at the end instead of the side means that each entire link is normalized and that it hinges perfectly. The metal of the chain is freed of internal strains—and no unnatural strains are added when the links hinge on one another.

ENDWELDUR has thoroughly proved itself in laboratory and field—and is ready to prove itself in your service.

The American Chain line includes iron chains as well as steel and alloy chains.

How ACCO's Modern Engineering and Efficient Organization Help You

American Chain engineers serve you in two important ways. They provide the best chains for countless purposes—and they work with you to put the most suitable chain equipment to work in the best way. They invite you to discuss your chain problems with them.

Ample stocks of American chains, fittings and attachments are located at strategic points throughout the country to serve the distributors from whom you buy.

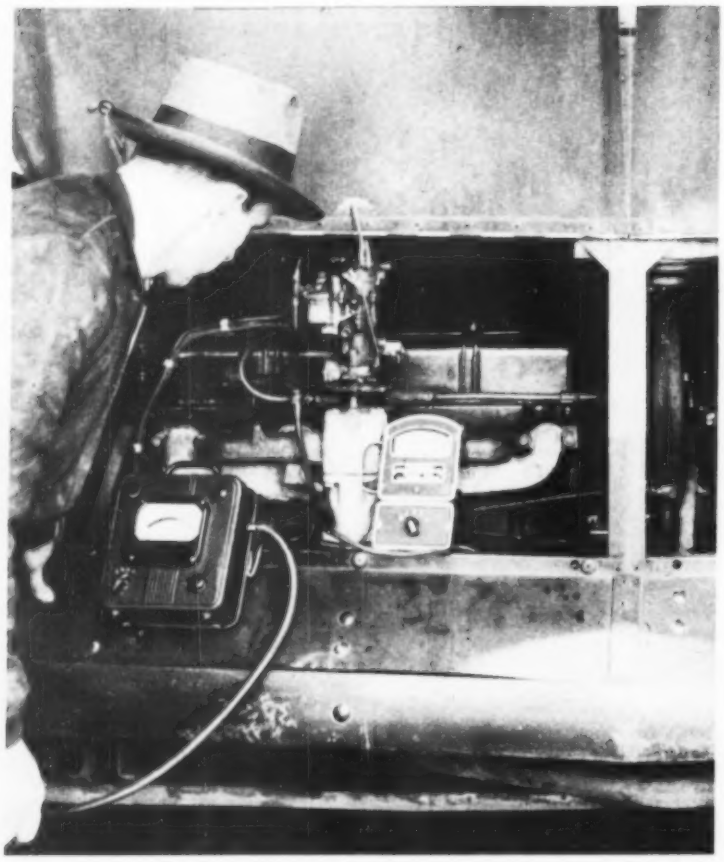
Send for this FREE Booklet

It gives all the important facts about *Endweldur* Sling Chains. Consult us (with no obligation) on any chain problem. Address **American Chain & Cable Company, Inc., York, Pennsylvania.**

AMERICAN CHAIN & CABLE COMPANY, Inc.

AMERICAN CHAIN DIVISION
AMERICAN CABLE DIVISION
ANDREW C. CAMPBELL DIVISION
FORD CHAIN BLOCK DIVISION
HAZARD WIRE ROPE DIVISION
MANLEY MANUFACTURING DIVISION
OWEN SILENT SPRING COMPANY, INC.
PAGE STEEL AND WIRE DIVISION
READING-PRATT & CADY DIVISION
READING STEEL CASTING DIVISION
WRIGHT MANUFACTURING DIVISION

In Canada: DOMINION CHAIN COMPANY, LTD.
In England: BRITISH WIRE PRODUCTS, LTD.
THE PARSONS CHAIN COMPANY, LTD



BUS COMPANY FINDS ISO-VIS PAYS OUT

When all the engines in a Kansas public service company bus fleet had to be torn down to remove varnish deposits a Standard Oil representative decided that it was a good time to show this prospect what a Standard Automotive Engineer could do. He persuaded the fleet owner to call in one of these engineers.

As soon as the engines were operating, the engineer made various tests including pyrometer readings of crankcase temperatures, etc. From the information he obtained he determined that because of the severity of the operation Iso-Vis Motor Oil should be used. Recently one of the engines was inspected after 60,000 miles of operation on Iso-Vis. Not a trace of varnish or sludge was found.

Why not call in one of these Automotive Engineers *before* trouble develops? He can help prevent as well as cure many of the ills that afflict fleet equipment.

TRUMAN L. FLATT SAYS HIS COSTS WERE CUT 30%

Operating costs can get out of line quickly in the fleet of bituminous distributing trucks operated by Truman L. Flatt, Springfield, Ill. Each truck has two gasoline engines, one of which operates a large part of the time at idling speed to

keep the asphalt circulating in the truck tank.

A large part of the saving which Mr. Flatt reports was made by the Automotive Engineer on these auxilary engines. With his instruments the engineer located carburetion troubles and corrected them. Adjustments were accurately made, which not only gave more economical operation, but assured trouble-free service on the job.

In summing up the results, Mr. Flatt writes:

"I am very well pleased with the saving shown in fuel and lubricating costs, and this, together with the services performed by your Automotive Engineer, has enabled me to reduce my operating cost as much as thirty per cent in the last year."

HERE'S WHERE YOU'LL FIND YOUR STANDARD AUTOMOTIVE ENGINEER...

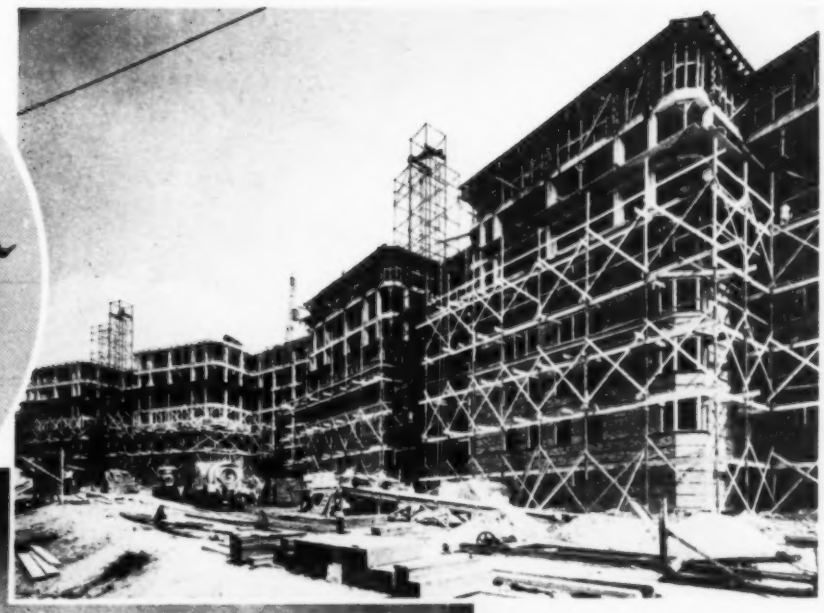
Billings, Montana
Chicago, Illinois
Davenport, Iowa
Decatur, Illinois
Denver, Colorado
Des Moines, Iowa
Detroit, Michigan
Duluth, Minnesota
Evansville, Indiana
Fargo, North Dakota
Grand Rapids, Michigan
Green Bay, Wisconsin
Huron, South Dakota
Indianapolis, Indiana
Joliet, Illinois
Kansas City, Missouri
LaCrosse, Wisconsin
Mankato, Minnesota
Mason City, Iowa
Milwaukee, Wisconsin
Minneapolis, Minn.
Peoria, Illinois
Quincy, Illinois
Saginaw, Michigan
St. Joseph, Missouri
St. Louis, Missouri
South Bend, Indiana
Wichita, Kansas

Why not have one of these engineers explain fully just what he does to help make these savings? A card to your local Standard Oil (Indiana) office or to 910 South Michigan Avenue, Chicago, Illinois, will reach the engineer you want. In Nebraska, call or write Standard Oil Company of Nebraska at Omaha. Just say, "We'd like to have your Standard Automotive Engineer call."

STANDARD OIL COMPANY (INDIANA)

AUTOMOTIVE ENGINEERING SERVICE — LOWERS MILEAGE COSTS

Shift *Your job into* High Gear



ROCKLIFFE APARTMENTS,
Montclair, N. J.

OWNER: Rockliffe Realty Corp., New York.

ARCHITECTS: Sugarman&Berger, New York.

GENERAL CONTRACTORS: R. M. C. Construction Co., New York.

CONCRETE CONTRACTORS: Industrial Engineering Co., New York.

LEHIGH EARLY STRENGTH CEMENT

SOONER or later every contractor meets a situation where increased construction speed is essential. It may be an emergency —a need for better job co-ordination to reduce costs—a demand for quick completion of the job.

In the Rockliffe Apartments, the Industrial Engineering Company found it necessary to speed up their original construction schedule for the concrete frame to offset several weeks delay resulting from unexpected and difficult rock excavation for the footings and foundations. By changing from normal portland cement to Lehigh Early Strength Cement for the concrete in the upper two floors they removed forms the day after pouring—completing the frame ahead of time. Other trades "stepped up" their schedules—the entire job was ready on time to meet the occupancy leases between owner and tenants.

Lehigh Early Strength Cement makes service strength concrete for any work 3 to 5 times faster than normal portland cement in any season. In cold weather—just ahead—this speed brings added benefits. It reduces hazards of damage by frost. It reduces the cost of heat protection by one-half to two-thirds, because the curing period during which concrete may require heat protection is correspondingly shortened.

Look into the advantages of Lehigh Early Strength Cement for your concrete work. The Lehigh Service Department will gladly be of service, without obligation.

LEHIGH PORTLAND CEMENT COMPANY

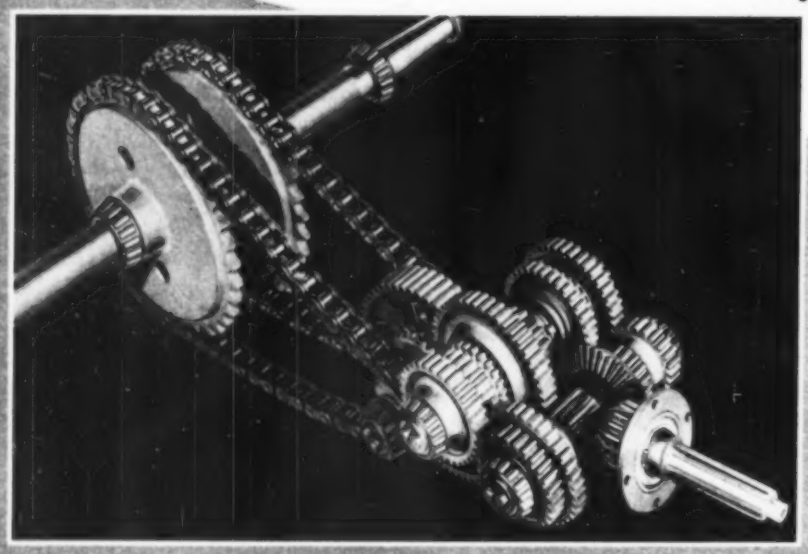
Allentown, Pa., Chicago, Ill., Spokane, Wash.

HEAPING PAY LOADS

KOEHRING HEAVY DUTY

"Loads of power for loading" means a heaping payload every trip with the Koehring Wheeler. Application of power is both behind and ahead of the cutting blade. Pusher tractor behind the cutting blade, synchronized with the pulling power of the Koehring Tractor, quickly forces the material well back in the Wheeler body for full loads. The Koehring Wheeler Method of moving dirt utilizes available power and speed to the fullest advantage — power for loading — speed for traveling. Dirt moving costs are lower when the Koehring Wheeler Method is used.

KOEHRING CO • Milwaukee, Wisconsin



Constant mesh transmission, housed in oil-tight case — spiderless type differential — without stub shafts or planetary gears — flexible chain drive — are important operating features of the Koehring Wheeler Tractor. Gears are compactly assembled yet easily accessible for inspection. Koehring Tractor maintenance costs are especially low.

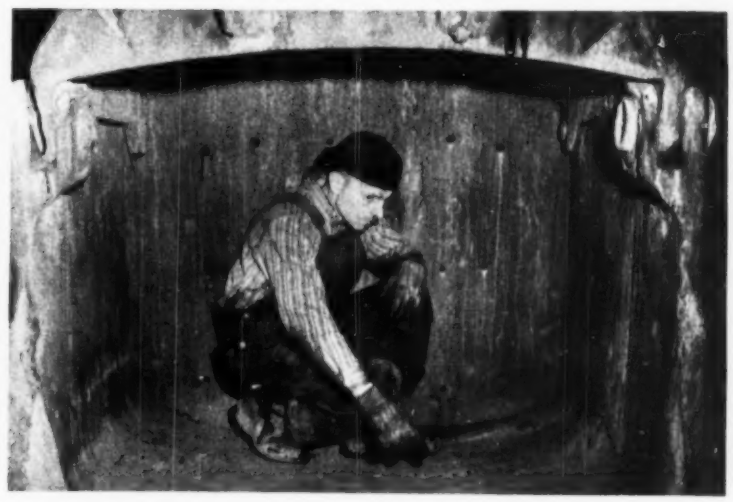
HEAVY-DUTY CONSTRUCTION EQUIPMENT

Construction Methods

ROBERT K. TOMLIN, Editor

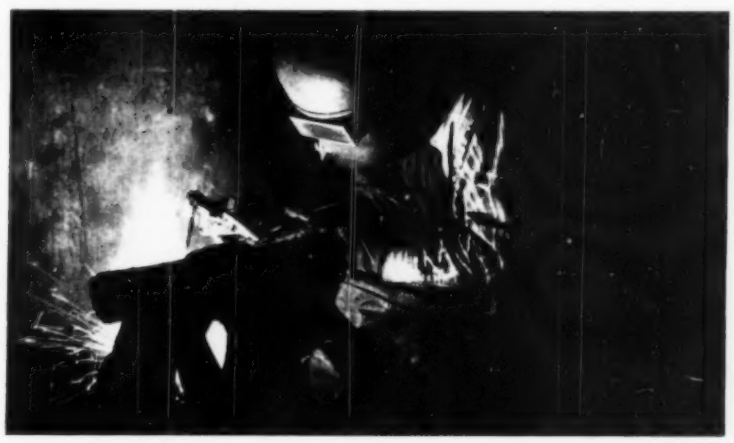
Volume 22 | NOVEMBER, 1940 | Number 11

SHOVEL TRACK PADS are reclaimed by arc welding. Replacement cost of these pads is $39 each. They are repaired in an average of about 2 hr. each, using about 4 lb. of electrodes, with total repair cost of approximately $3.



WORN SHOVEL BUCKET is reconditioned by building up interior surface with manganese steel electrode for depth of approximately ¼ in. Total cost of repairs was $75. Replacement cost of bucket, without door, would have been $1,000.

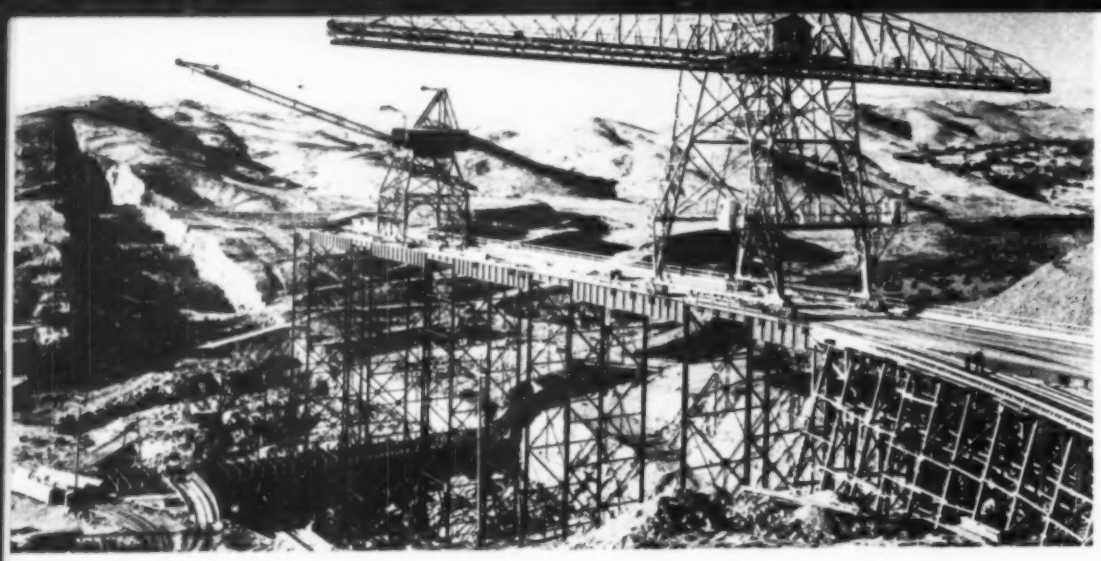
Arc Welding AIDS EQUIPMENT REPAIR



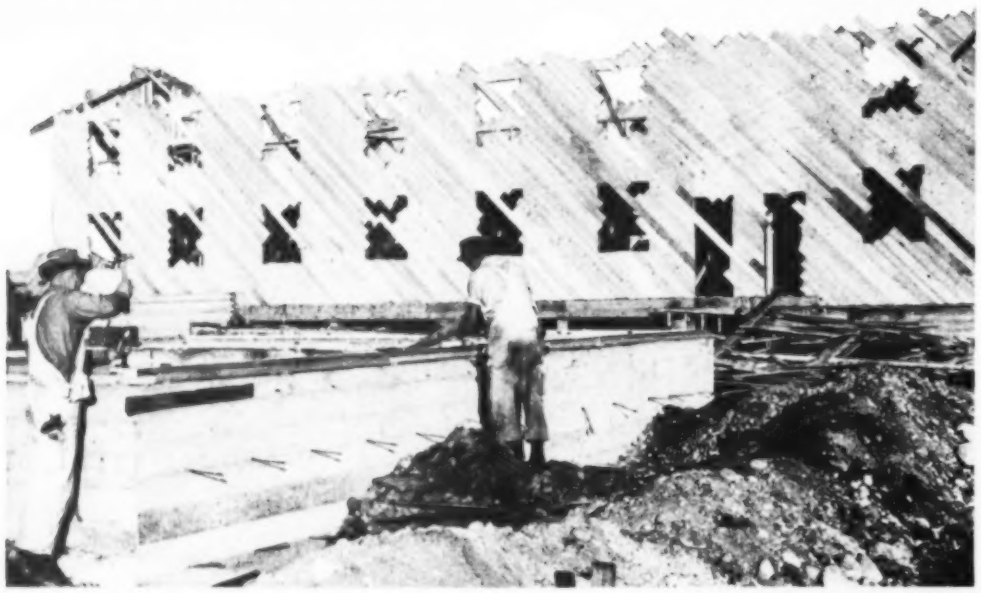
SHOVEL SPROCKET TEETH are built up with hard-surfacing electrode. Pads are laid longitudinally as shown to restore teeth to their original dimensions. Costly replacement has been avoided three times in case of this one part.

HOW ARC-WELDING AIDED the E. J. Albrecht Co., contractor, of Chicago, in the economical maintenance and repair of construction equipment used on the flood control project at Johnstown, Pa., is illustrated in the accompanying photographs showing various applications of Lincoln welders and welding rods. Captions to pictures include figures on repair costs.

WORN DIPPER TEETH (right) receive special replacement tips welded with manganese steel electrode. Manganese steel tip then is hard-faced with abrasion-resisting electrode. On teeth of this size costing $7 for replacement, total cost of repair is approximately $3.75, including 1 hr. of labor plus materials. Manganese cap costs about $1.75 which is included in total repair cost of $3.75.



BIG HAMMERHEAD CRANES (left) and gantry-mounted revolving cranes, operating on steel trestle place concrete from 4-cu.yd. buckets in main body of Friant dam, 320-ft.-high structure in California which is under construction on San Joaquin River for U. S. Bureau of Reclamation by Griffith Co. and Bent Co., contractors, of Los Angeles. Completed dam, 3,430 ft. long on its crest, will contain about 2,000,000 cu.yd. of concrete. Low bid on project was $8,700,000, with Federal Government supplying materials estimated at additional $7,300,000.

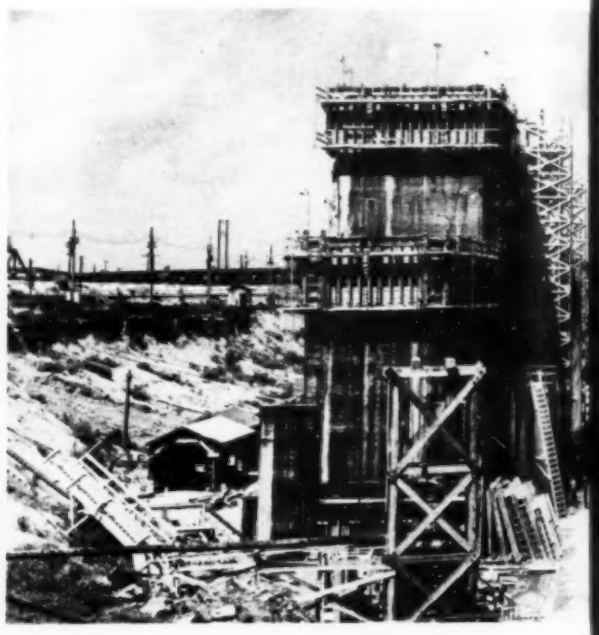


RUSH WORK ON ARMY BARRACKS at Fort Lewis, Wash., is under way to accommodate personnel of National Guard and those drafted for military training under newly enacted selective service legislation.

Wide World Photo

THIS MONTH'S NEWS REEL

LOCK CONSTRUCTION (below) at Kentucky Dam at Gilbertsville, Ky., is in full swing by forces of Tennessee Valley Authority. Largest river development project ever undertaken East of Mississippi, Kentucky dam is scheduled for completion in 1945 at cost of $95,000,000, exclusive of power installations. For lock, dam and power house 1,100,000 cu.yd. of concrete will be required. Navigation lock, 110x600 ft., will have lift of 57 ft.



NEW NATIONAL AIRPORT (below) across Potomac River from Washington, D. C., nears completion on 729-acre site, where 18,000,000 cu.yd. of sand-gravel fill was pumped into runway areas, as described in "Construction Methods" for August. Runways are paved with asphaltic concrete surfacing on 9-in. stabilized base.

Fairchild Aerial Photo

COURSE OF INSTRUCTION in operation of tractors is conducted as voluntary contribution in interests of national defense by Warnard Constructors, Inc., general contractors of Dorchester, Mass. Open to men of contractor's organization, as well as others in vicinity of Palmer, Mass., where company is building Monson State Hospital, tractor school is intended to supply preliminary training which will later be useful in operation of Army tanks and other motorized military equipment.

LOW RENT HOUSING in New Orleans, La., is being provided on mass scale by Iberville St. project which J. A. Jones Construction Co., of Charlotte, N. C., is building under $2,933,900 contract to supply 858 three-story dwelling units. Net construction cost per dwelling is estimated at $3,000 by The Housing Authority of New Orleans for which Alvin M. Fromherz is consulting engineer and executive director

FINAL OPERATIONS at Fort Peck dam, U. S. Engineer Department's hydraulic fill project on Missouri River in Montana, involve placing of rock fill on upstream face of huge structure. Rock, which is placed on blanket of gravel, is handled conveniently by means of two Lewis pins inserted in drilled holes. Delivered on railway cars, rocks are swung into place by crawler cranes. Dam is being completed under direction of Major C. N. Iry, Corps of Engineers, U. S. Army.

RAZING OF NINTH AVE. ELEVATED RAILROAD in New York City is started Oct. 7 as Mayor LaGuardia applies cutting torch to steel structure.

CONTINENTAL DIVIDE TUNNEL. (below) measuring 13.1 mi. in length, is driven as part of U. S. Bureau of Reclamation's Colorado-Big Thompson project. When completed by Magoffin Construction Co. and lined with concrete, bore will have diameter of 9 ft. 9 in. In heading from East portal Eimco-Finlay loader handles muck. Support for rock is provided by 6-in. steel H-beam ribs. For Reclamation Bureau, Porter J. Preston is supervising engineer in charge of project.

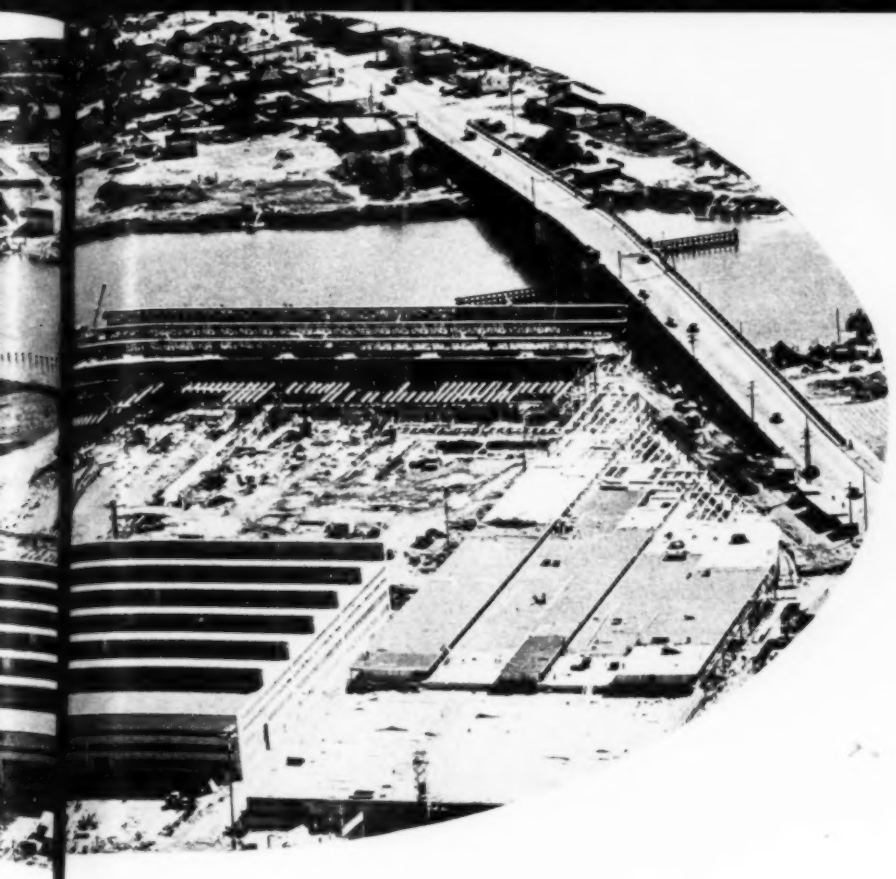
Aircraft Plant Addition

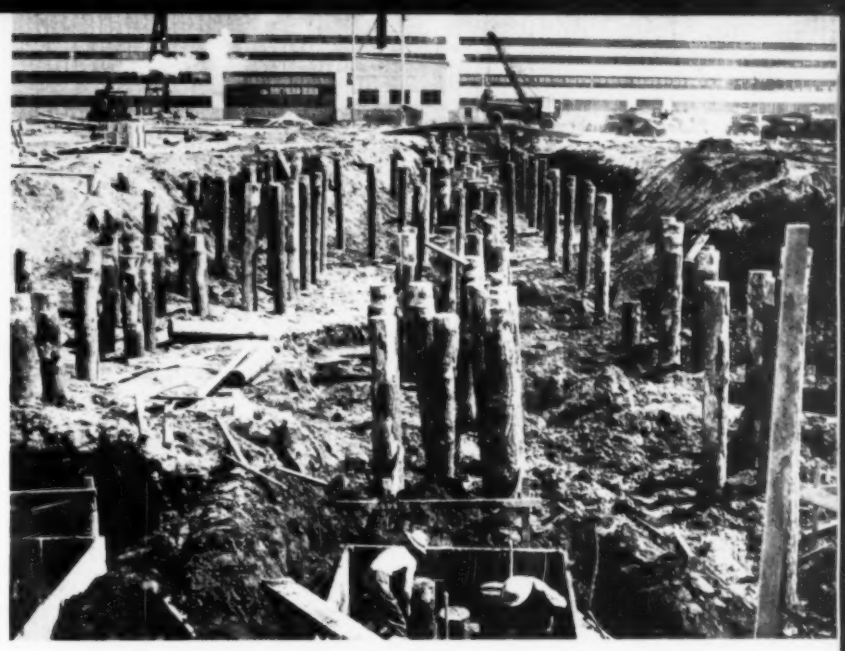
COVERING 15 ACRES
BUILT IN 90 DAYS

ECTION OF 44-
OOF TRUSS, with span o
0 ft., is lowered into po-
ion for support by lat-
ed steel columns at main
sembly shop.

EXTENSION OF BOEING PLANT, covering area of 15 acres, includes warehouse (at right) and shop buildings (center) which will add 450x700-ft. steel frame structure to existing Plant No. 2 (in foreground).

COMPLETED WITHIN A TIME LIMIT of 90 days by speedy construction and effective job organization, a 15-acre addition to its existing plant at Seattle, Wash., involving a cost of $1,800,000, will enable the Boeing Aircraft Co. to step up production for purposes of national defense of its "Flying Fortress", a 22-ton, 4-engine bombing plane with a wing spread of 104 ft., for which orders on Sept. 1 totaled $70,000,000, with additional government demands for this type of aircraft in prospect. Designated as part of Boeing's Plant 2, the new facilities built by The Austin Co., engineers and contractors, of Cleveland, Ohio, add 660,000 sq.ft.—a 75-per cent increase — to the company's floor space for manufacture and assembly of aircraft by 15,000 employees.

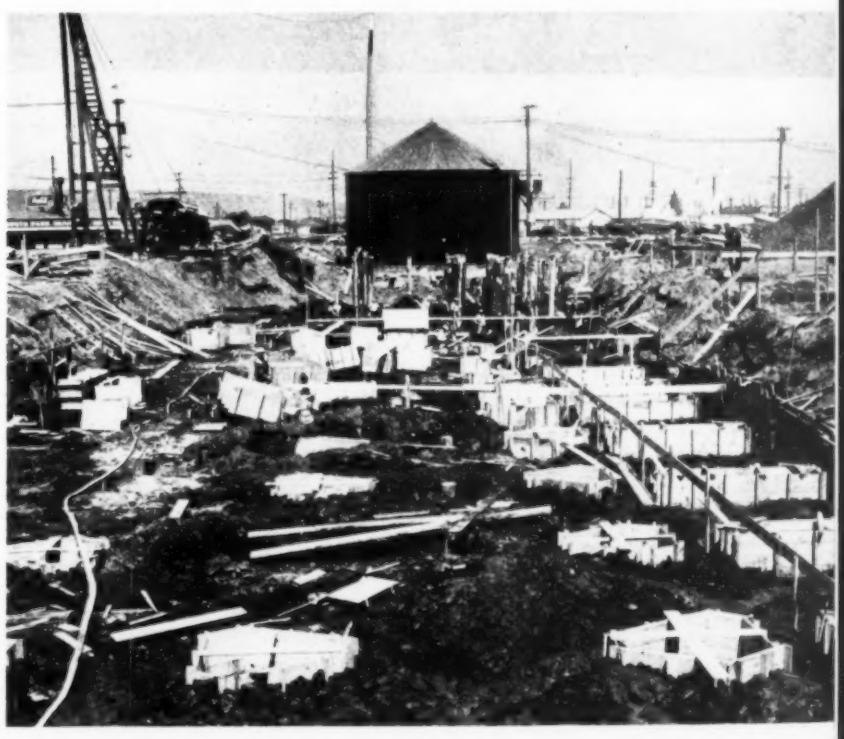




SUBSTRUCTURE FOR PLANT EXPANSION required driving of 3,250-ft. timber piles **(above)** ranging in length up to 35 ft. through sand fill on swamp bottom. Wood forms **(below)** are set to form concrete caps on pile clusters.

The new plant additions, located on the Duwamish waterway, an arm of Seattle harbor, include a 152,000-sq.ft. warehouse, a 450x700-ft. shop structure, in three sections, for manufacture and assembly of big bombers, boiler house, paymaster's office and 80,000 sq.ft. of outdoor paving. Raw materials from the warehouse first enter a 200x450-ft. section of the plant equipped for drop-hammer forging and hydraulic press work. Thence they pass to a two-story 250x450-ft. section devoted to machine shops, welding, sheet metal and sub-assembly operations. A third 250x450-ft. section of the plant, with overhead clearance of 35 ft. throughout, homes final assembly. Layout of the new factory area provides for an orderly flow of work from the raw material stage through primary and sub-assembly stages to the finished product.

For the main plant buildings having an overall height of 54 ft., the design calls for pile foundations, 5-in. thick concrete floors, steel superstructure with saw-tooth roof trusses carried by latticed columns, sidewalls of asbestos



ACCESS AND UTILITY TUNNELS (below) of concrete are feature of Boeing's new plant buildings. These tunnels carry piping and ducts in addition to providing underground routes to factory floor areas.

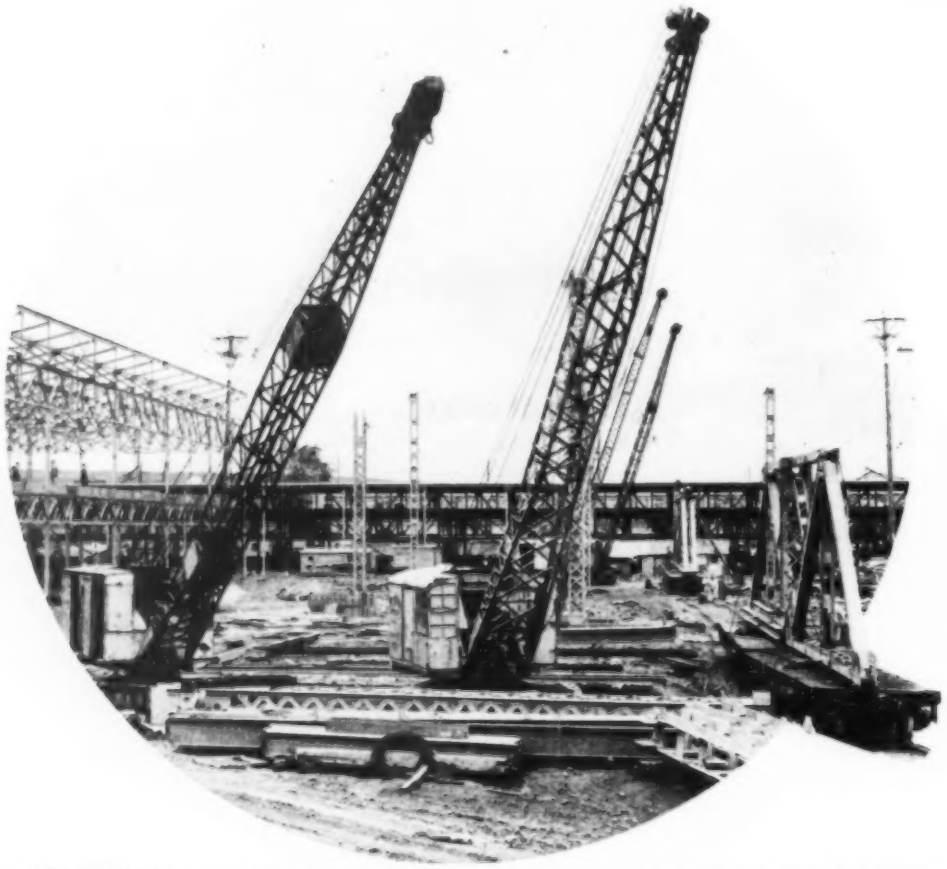
CONCRETING OF TUNNELS (below) providing access to factory building floors is done with rubber-tired buggies on plank runways.

WHARF CONSTRUCTION, in addition to buildings, is involved in plant expansion project, which is adjacent to Duwamish waterway, an arm of Seattle's harbor. In background piledriving and excavation for access tunnels serving factory buildings are in progress.

board and roofing of wood overlaid with ½-in. fiberboard and aluminum-surfaced composition roofing. An outstanding feature of the layout is a system of concrete tunnels to contain all service utilities, such as electric, compressed air and water lines, and also to provide direct access to the shop floors with a minimum interference to manufacturing operations. Entrance to all plant areas is through this system of underground corridors, consisting of two cross-tunnels 700 and 450 ft. long and an intersecting longitudinal tunnel 700 ft. long.

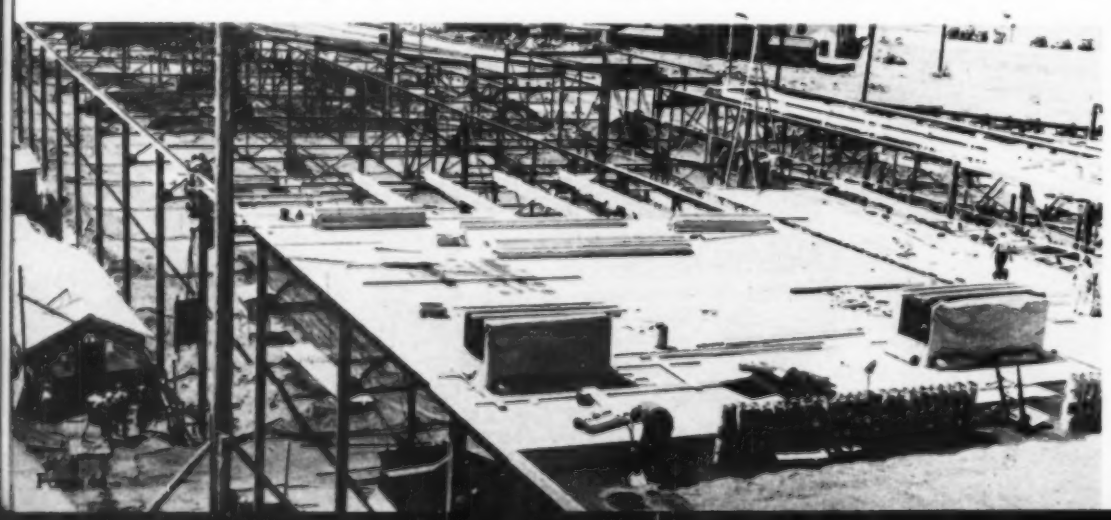
Columns for the shop buildings are spaced 50 ft. apart longitudinally. The 450-ft. width of the buildings is divided into one 200-ft. bay and two 125-ft. bays, spanned by steel trusses to pro-

(Continued on page 100)

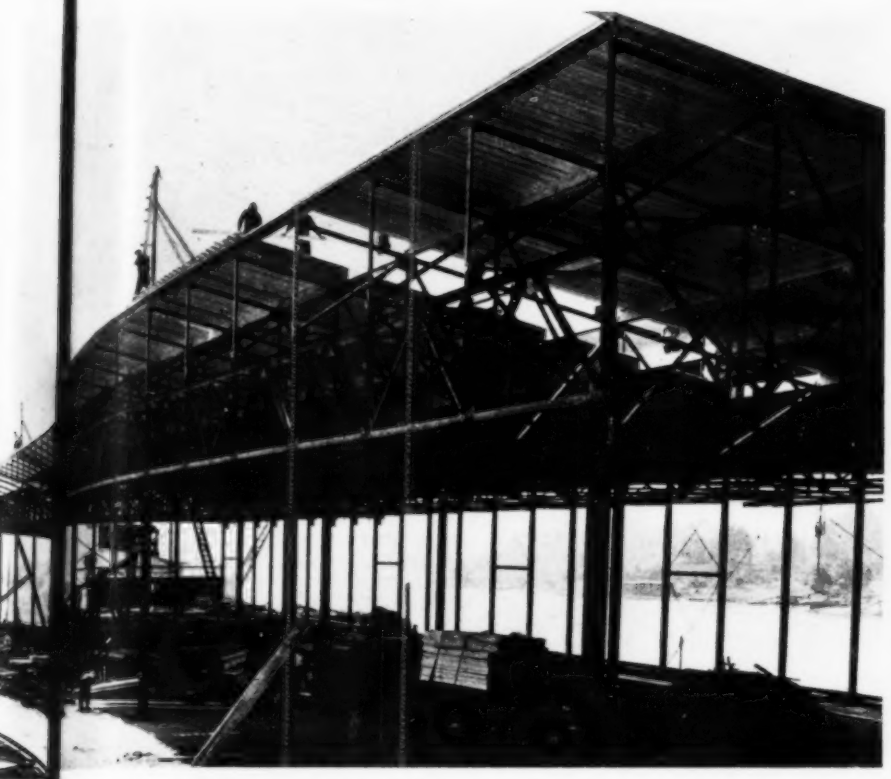


HEAVIER TRUSSES were fabricated at one local plant that was strike-free and were delivered to job on flat cars (at right of picture) for erection by crawler cranes.

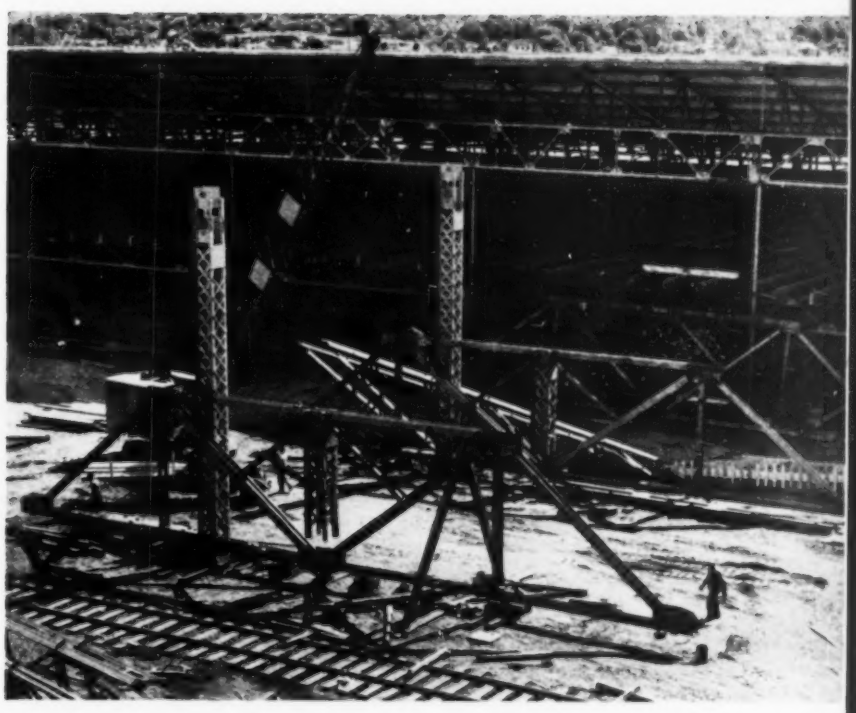
WAREHOUSE (below) for storage of raw materials and parts covers area of 152,000 sq.ft. It parallels assembly shop structures from which it is separated by 29½-ft. covered aisle.



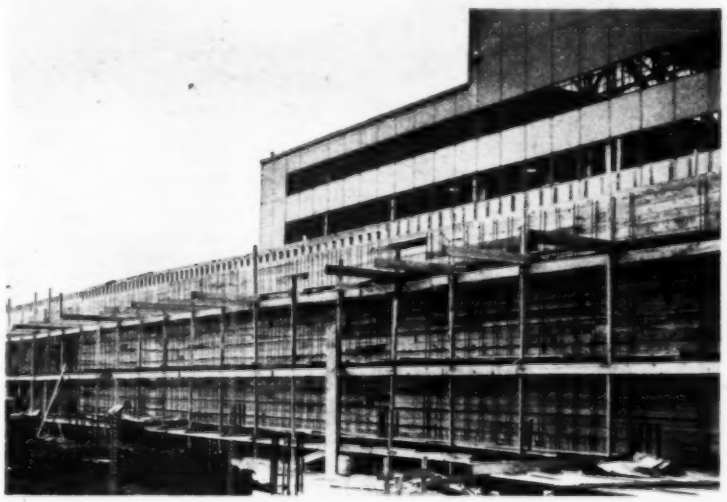
SAW-TOOTH ROOF DESIGN was adopted to insure maximum natural light for manufacturing operations. View shows two-story section of assembly plant.



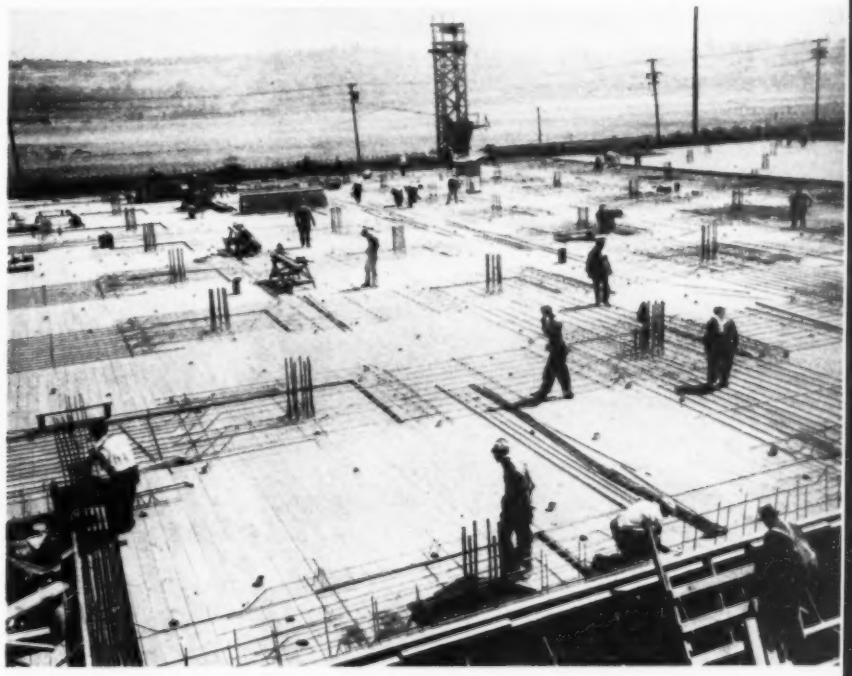
STEEL ERECTION for 200x450-ft. section of plant is handled by crawler cranes. At right note wood roofing being applied to saw-tooth trusses.



ASSEMBLY PLANT TRUSSES in some cases were erected in three sections with ends carried temporarily on timber A-frames.

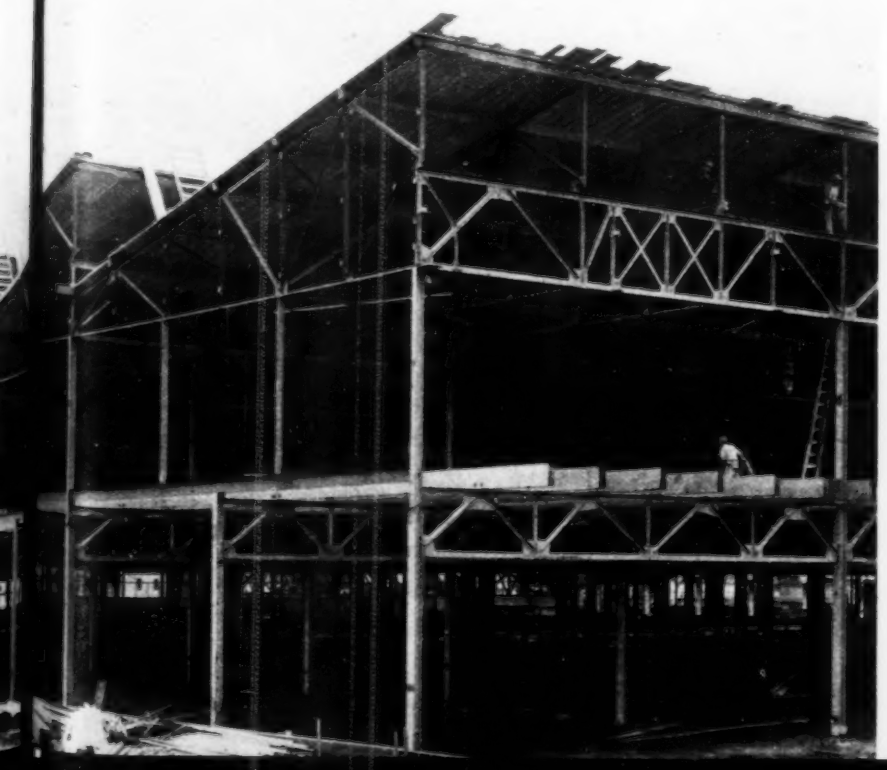


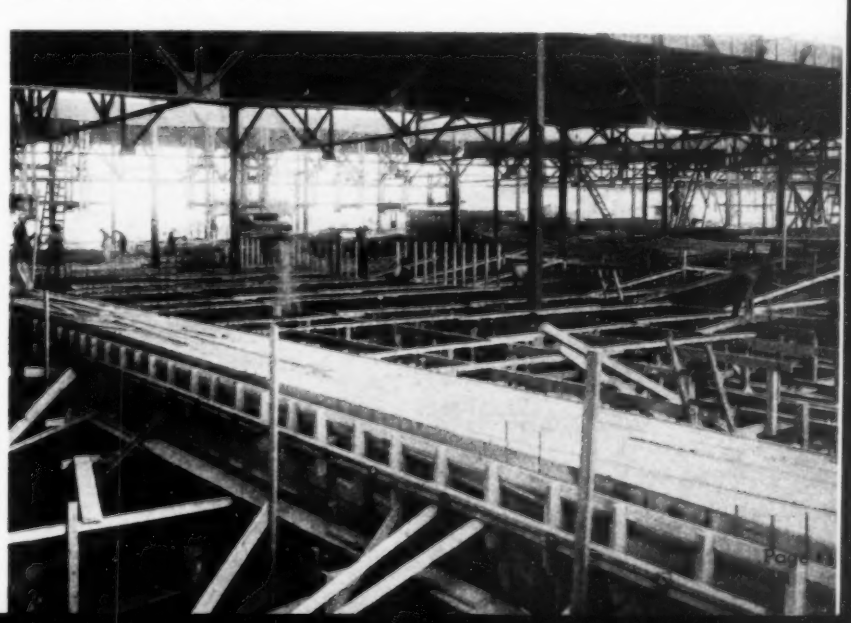
FOR SIDEWALLS OF WAREHOUSE wood forms and steel reinforcement are in place for concreting. In background is section of existing assembly plant whose output will be increased by present construction.



FUTURE ENLARGEMENT of warehouse is provided for by temporary roof deck. Reinforcement extends up through second floor of structure to which two additional stories will be added at some later date.

CONCRETE FORMS (below) are in place for one of access and utility tunnels which serve assembly floor areas. Main tunnels are 16 ft. wide and cross-tunnels are 10 ft. wide.



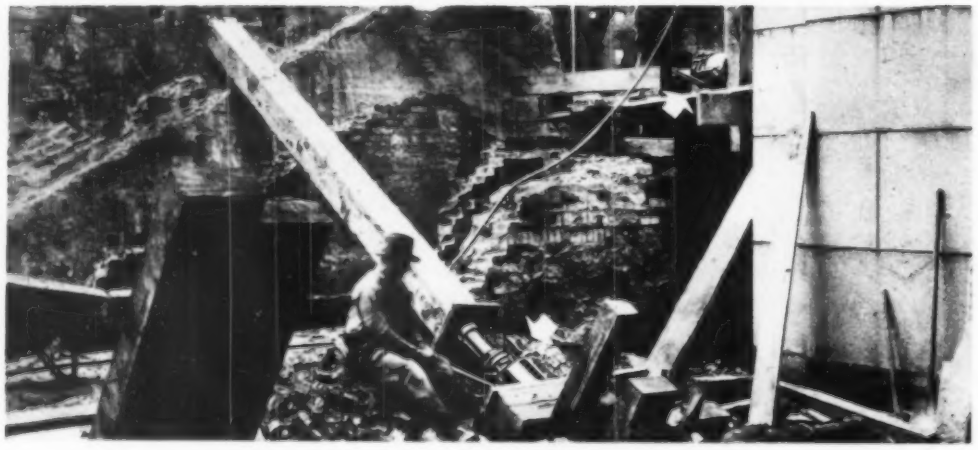


SMALL TOOLS ON CONSTRUCTION

1

2

3



4

5

6

1 **METAL INSULATION SHEETS** used in house construction are cut, five at a time, to proper size with this curved knife blade. Made in standard size of 24x32 in., these thin (0.006 in.) sheets of steel (Ferro-Therm) weigh 0.25 lb. per square foot and are claimed to reflect 95 per cent of radiated heat, in addition to acting as a fire stop. They are covered with a rust-resistant coat of lead and tin.

2 **COMPACTING OF EARTH** at Potrero housing project, San Francisco, Calif., is done with Thor pneumatic tamper. Meyer Construction Co. finds this tool useful in places where irregularities make it impossible to consolidate earth in horizontal layers.

3 **FOR CUTTING WIRE ROPE** employed in operating power-control units on LeTourneau tractor-hauled carryall scrapers, this cable-cutter (Morse-Starrett) is supplied as standard equipment and is mounted on corner of case for handy use. For cutting, sharp, square blows with 2½-lb. hammer is recommended rather than single smash with heavy sledge.

4 **DEMOLITION OF CONCRETE WALL** was speeded by use of heavy-duty, 75-ton hydraulic jack (Blackhawk) used to push over masonry structure. Operator first uses speed pump on jack for quick contact with load and then changes over to power pump for easy lifting of high tonnages. Jack weighs 282 lb. and has 9-in. hydraulic lift.

5 **FOR CLEANING CATCH-BASINS** this midget bucket (Hayward) is available in diameters (closed) of 13, 15 and 18 in. and weighs 110, 320 and 385 lb. Can be operated by any type of machine equipped with double-drum power hoist or with hand power hoist. Has four blades and works on principle of orange-peel bucket.

6 **IMPACT WRENCH** tightens nuts on heavy-duty wheel assembly equipped with big pneumatic tire for earth-moving operations. Operated by compressed air this Ingersoll-Rand tool converts torque from motor into rotary impacts. To resist shock and fatigue, hammer which delivers blow and anvil which receives it are made of nickel-chromium-molybdenum steel.

Photo, International Nickel Co.

7 **CUTTING OF FIBERBOARD** is done with this Stanley tool, which proves useful for forming grooves, slitting and beveling insulating board of a composition similar to Celotex.

8 **EXTENSION ROD** permits operator of Yankee brace and bit to maintain standing position while using tool as wood auger.

R. A. Wurgel Photo

9 **RAPID SPIKE DRIVING** in wood deck planking is done at Friant dam in California with aid of Ingersoll-Rand pneumatic hammer, operated by crew of Griffith Co. and Bent Co., contractors.

10 **FINISHING OF CONCRETE FLOORS** for two-story buildings of Valleyview housing project in Cleveland, Ohio, is accomplished with this electrically powered surfacing machine, plugged into outlet boxes located at frequent points on job and served by electric cables carried on poles.

11 **SINKING OF CAISSONS** to 70-ft. depths for building substructure is handled by battery of Blackhawk extra heavy lift (75 tons) hydraulic jacks, reacting against steel I-beams. Jacks weigh 282 lb. each, have plunger travel of 9 in. and are equipped with both speed and power pump.

12 **HEAVY MACHINERY** for power house at Grand Coulee dam, U. S. Reclamation project in Washington, is installed with aid of 6-ton Chisholm-Moore chain block hoists.

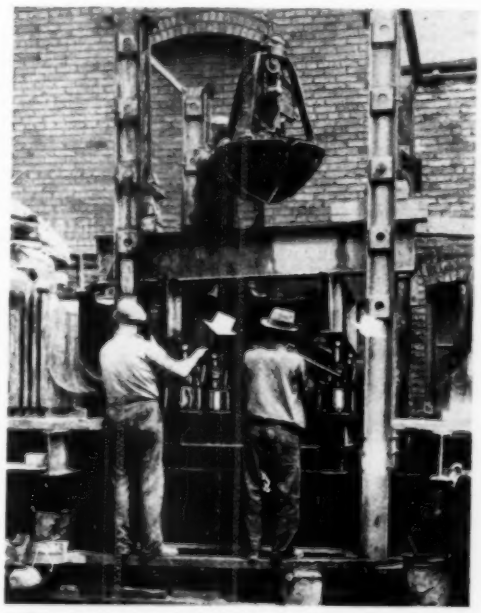
13 **DRILLING OF BOLT HOLES** for wood frame house construction is handled with electrically-powered Black & Decker portable drill, fitted with auger bit.

7

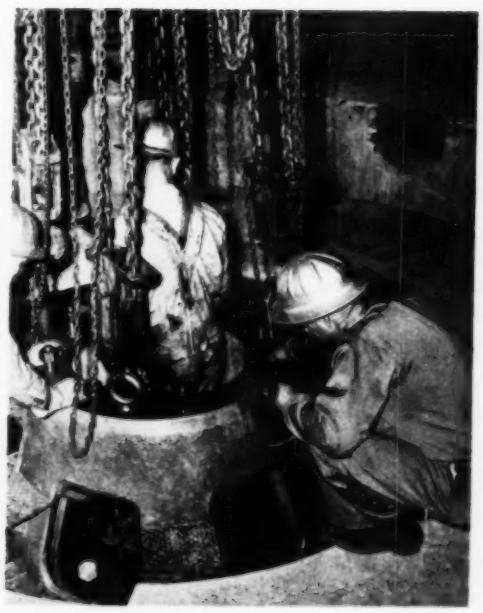
8

9

10

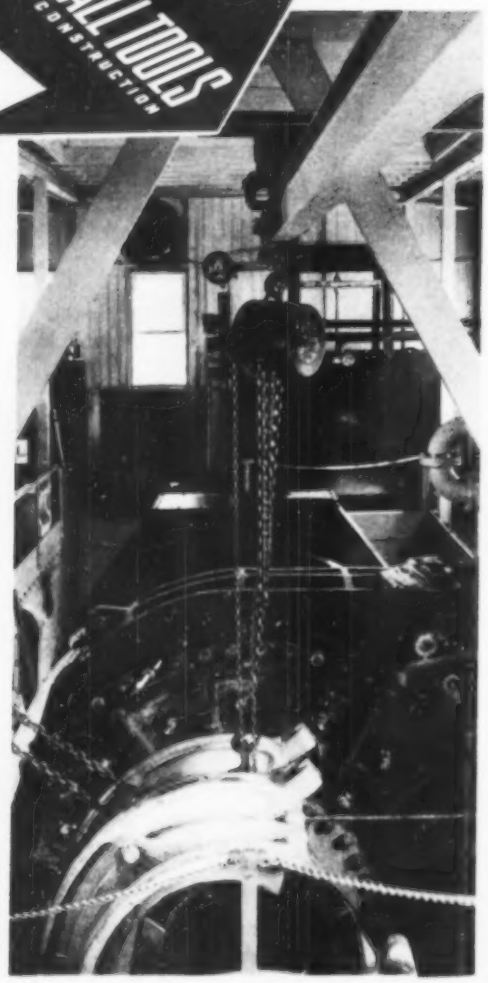


11

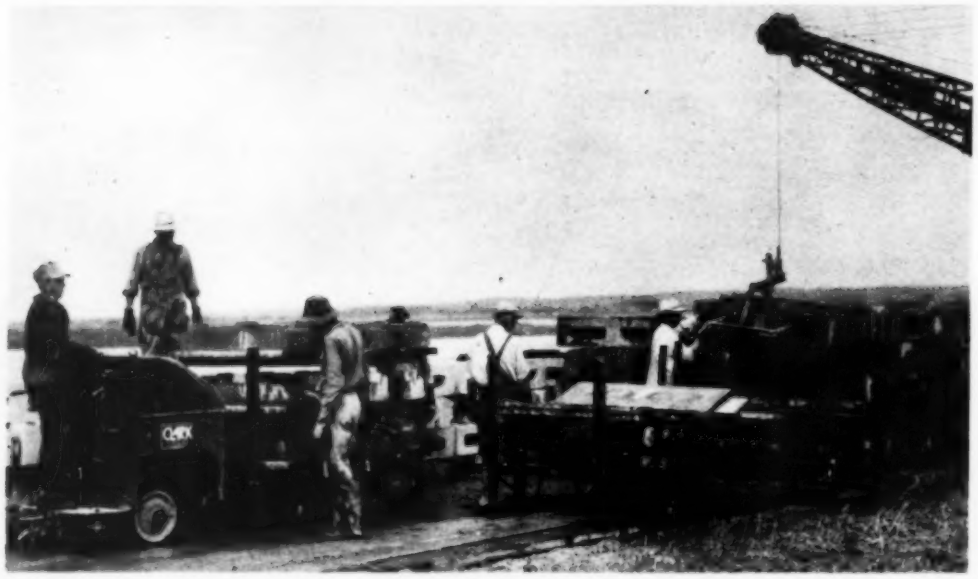


12

13



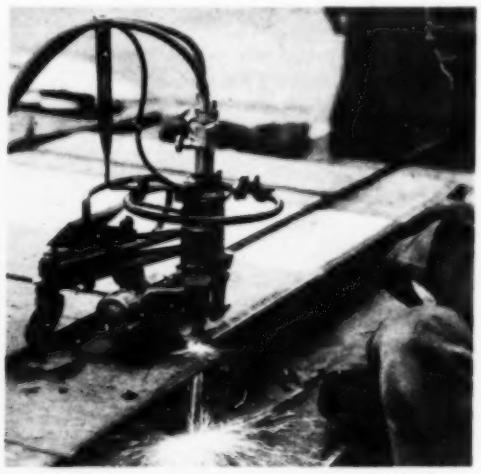
2-TON CHAIN HOIST (Clyde Hercules) on overhead trolley I-beam lifts manhole section of 34-in. intake pipe to permit inspection and repair of 30-in. centrifugal pump on dredge Keystone, one of two 30-in. dredges pumping 26,000,000 cu.yd. of sand and gravel for Minneapolis Dredging Co. — Martin Wunderlich Co., contractors, into Kingsley dam of Central Nebraska Public Power & Irrigation District.



PRECAST RIPRAP BLOCKS ride from spray-curing rooms to storage yard on metal pallets resting on steel racks picked up and transported by electric-storage-battery lift trucks (Clark) on $1,000,000 contract of A. H. Read Co., Cheyenne, Wyo., to precast and place 981,000 concrete riprap units, with wrought-iron locking bars to hold them in position, on Kingsley dam for Central Nebraska Public Power & Irrigation District. Special pickup device enables crane to lift full tier of riprap units from rack.

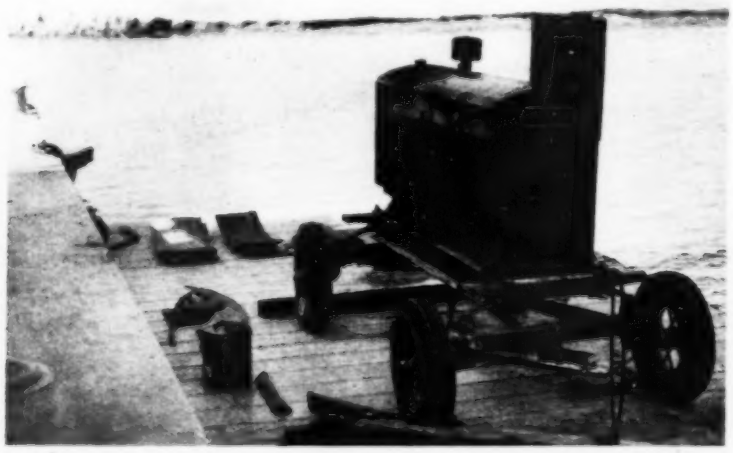
Small Tools ON BIG JOBS

ACCOMPANYING PHOTOGRAPHS illustrate uses of portable equipment and hand-controlled tools by contractors at Kingsley dam, 26,000,000-cu.yd. hydraulic fill embankment on the North Platte River near Ogallala, Neb.



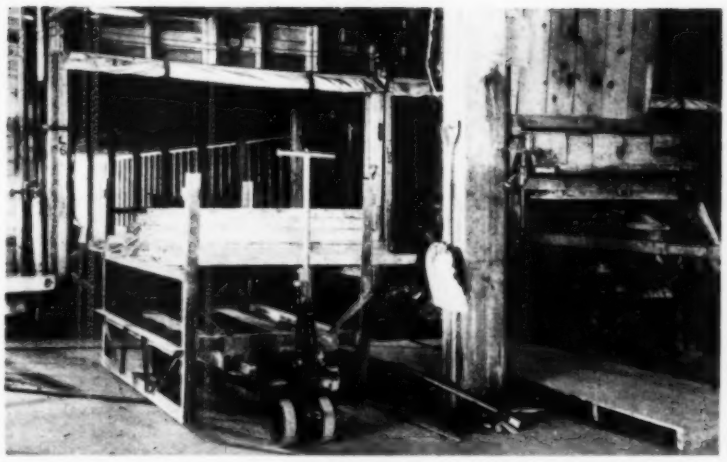
AUTOMATIC CUTTING TORCH set by operator to travel 24 in. per minute cuts 21-in. pallet with two 2-in. flanges in 1 min. 25 sec. to 1 min. 30 sec. Forward travel of machine is stopped while torch burns through 2-in. depth of flange. Gas pressure supplies motive power for torch. This apparatus (Oxweld) cuts 4,000 steel pallets for Kingsley dam riprap units on contract of A. H. Read Co., Cheyenne, Wyo.

GLASS SHIELDS protect eyes of workmen using grinder (Walker-Turner) driven by ½-hp. 110-v. motor on hydraulic dredge Keystone.

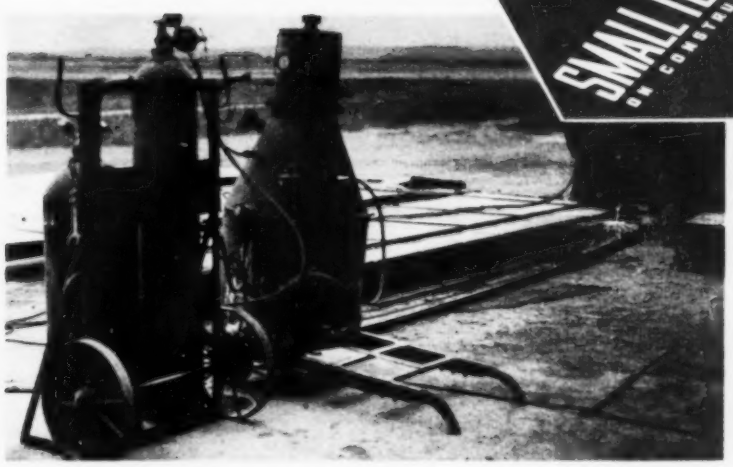


WELDING CURRENT for work inside pump and intake pipe, comes from portable gasoline-engine-driven generator (P & H Hansen) on small barge alongside dredge

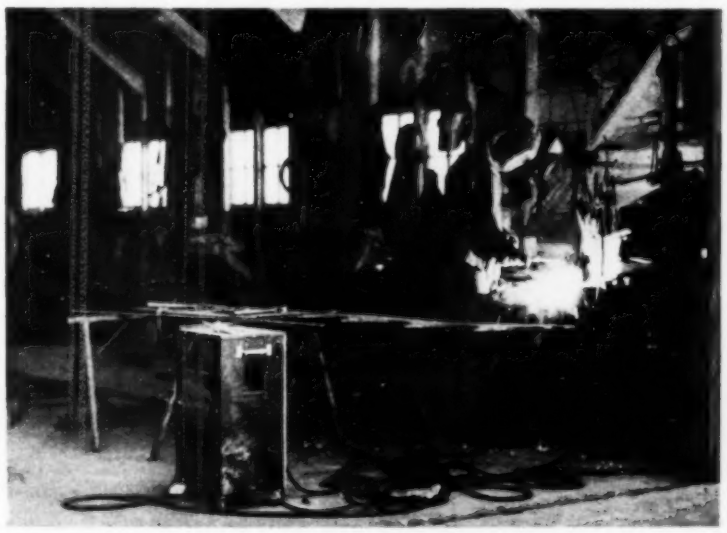
SMALL TOOLS ON CONSTRUCTION



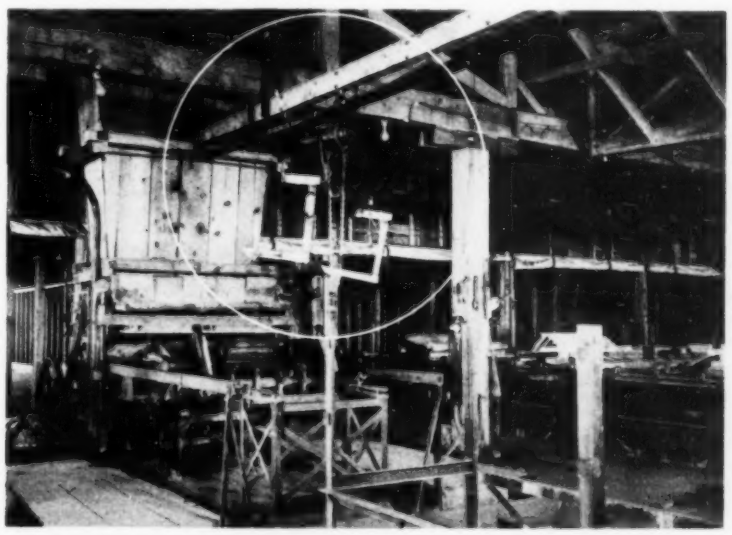
IN CASTING ROOM hand-operated lift trucks (Barrett) capable of picking up fully loaded racks are used also to spot empty racks and pallets. At right is one of two block-molding machines (Stearns), fed with concrete from mixers on floor above, designed to cast units at average rate of three per minute.



MAKING PALLETS of 3/16-in. steel plates salvaged from dismantled oil storage tanks, operator cuts group of pallets to proper length by continuous operation of automatic cutting torch (Oxweld) guided by steel templet clamped to pallets. Plates previously have been formed with 2-in. flanges at both edges by folding brake. Acetylene generator, charged with carbide, and oxygen cylinder supply gases to cutting torch.

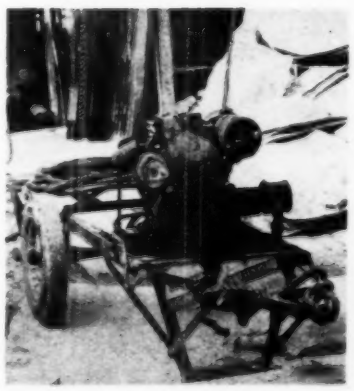


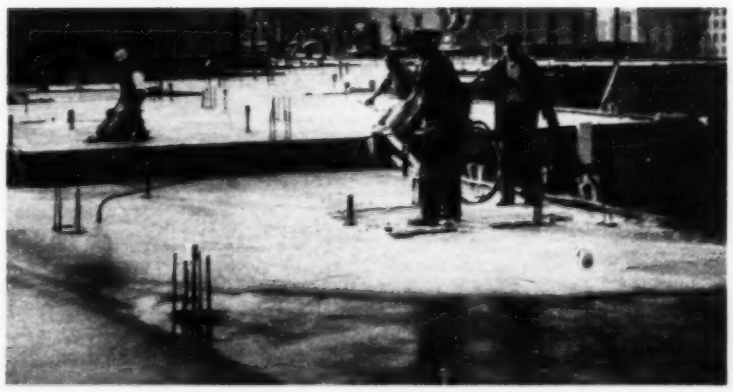
PORTABLE A. C. WELDER (Marquette) fills utility need in shop of A. H. Read Co. at Kingsley dam, near Ogallala, Neb.

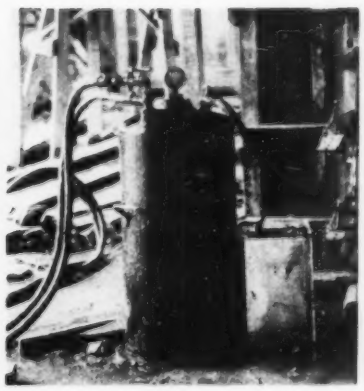


ELECTRIC-MOTOR-DRIVEN CHAIN HOIST (Chisholm-Moore) ¼-ton capacity, operated by ½-hp., 220-v., three-phase motor, is pulled by hand along overhead trolley after it has picked up precast riprap unit turned out on steel pallet by block machine in background. Trolley hoist lowers loaded pallets on to welded portable rack in foreground.

CURING CONCRETE *Floors and Roofs*







APPLYING PAVEMENT CURING METHODS to buildings, Corbetta Construction Co., New York City, uses Thompson Materials Corp. equipment to spray curing compounds on concrete floors and roofs of New York City Housing Authority's Queensbridge Houses, involving 2,000,000 sq.ft. of reinforced slabs. As soon as finishers complete hard troweling of surface, operator applies thin, elastic membrane of asphalt emulsion from spray nozzle. When rain or high winds appear imminent, contractor changes to colorless curing compound to avoid staining brick walls. Portable compressor outfit on ground (left) supplies air at 85-lb. pressure to 20-gal. tank (right) on upper floor, connected by hose to spray pipe. Operator easily covers 17,500 sq.ft. of slab in one building with 35 gal. of asphalt emulsion during afternoon.

SMALL TOOLS ON CONSTRUCTION

Building Materials INSTALLED WITH AID OF Small Tools

IN ADDITION TO SUCH LONG-USED PRODUCTS as brick, lumber, steel and concrete, modern building construction is employing a wide range of other materials whose installation can be handled most effectively with the aid of small tools. Typical examples of small tool applications in connection with metal roofing, fiberboard and gypsum products are illustrated on this and the next three pages.

METAL ROOFING AND FLOORING

Photos, Truscon Steel Co.

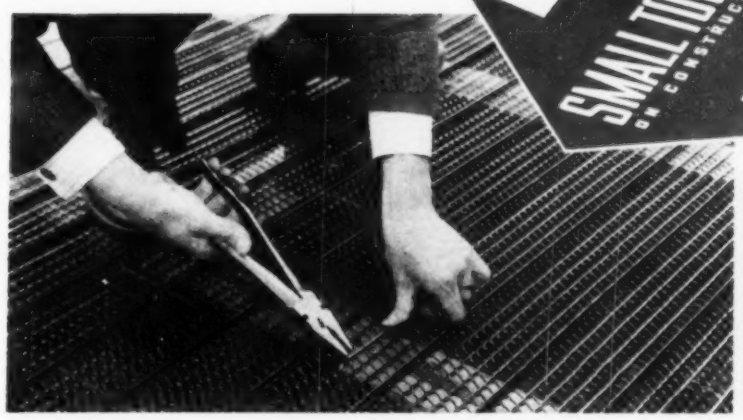
CORNICE AND NAILER BEAD is attached to metal roof deck by worker with screwdriver.

BUTT JOINT CLIP is inserted in Ferroboard sheet-steel roofing with aid of hammer.

METAL ROOF DECK is anchored to steel purlins of building by electric arc-welding equipment.

BENDING OF PRONG on purlin clip by hammer blow holds Ferroboard metal roof panels in place.

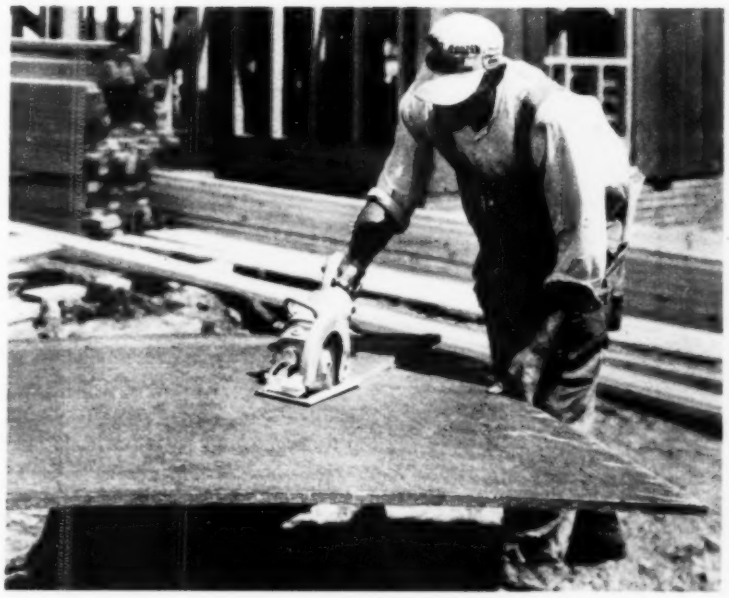
SPECIAL SPADE installs metal Floretyle in prongs of locktyle lath.



TO HOLD METAL LATH to top chord of Truscon steel joist, clip is attached with aid of pliers.

FIBER BOARD SHEATHING

Photos, The Celotex Corp.



GABLE CUT in Celotex vapor-seal sheathing is made by carpenter using Skilsaw portable electric saw.

OPENINGS IN DOORWAYS are cut by electric saw after sheathing has been applied to studding.

PATCHES IN SHEATHING are cut by electric saw to provide openings for air ducts, piping or other service facilities.

ACOUSTICAL PANEL of sound-deadening Celotex material is trimmed by saw to proper shape for use in kitchens, office buildings and hospitals.

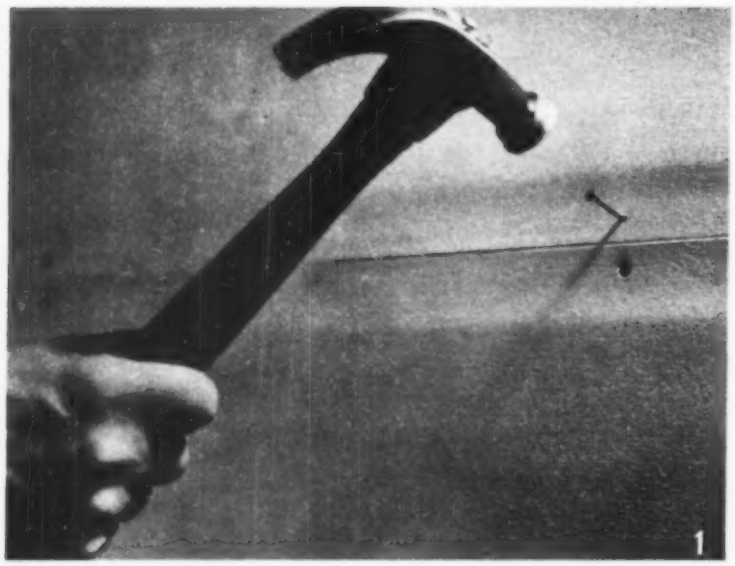
SMALL TOOLS ON CONSTRUCTION

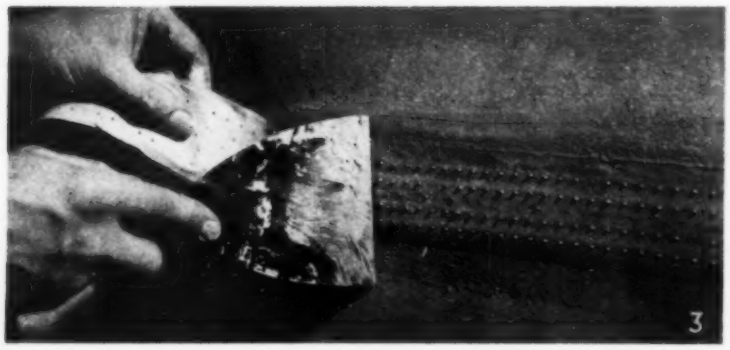
CEMENT-BONDED WOOD FIBER, known as Thermax, may be cut with ordinary electric saw. This insulating material is used both as a plaster base and for structural strength in all types of residential and industrial construction.

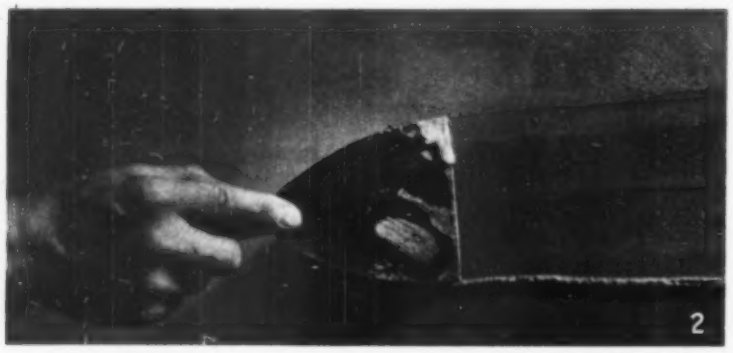
ROOFING MATERIAL, known as Traffic Top board, is readily sawed for installation on flat-top roofs and promenade areas.

GYPSUM PRODUCTS

Photos, U. S. Gypsum Co.





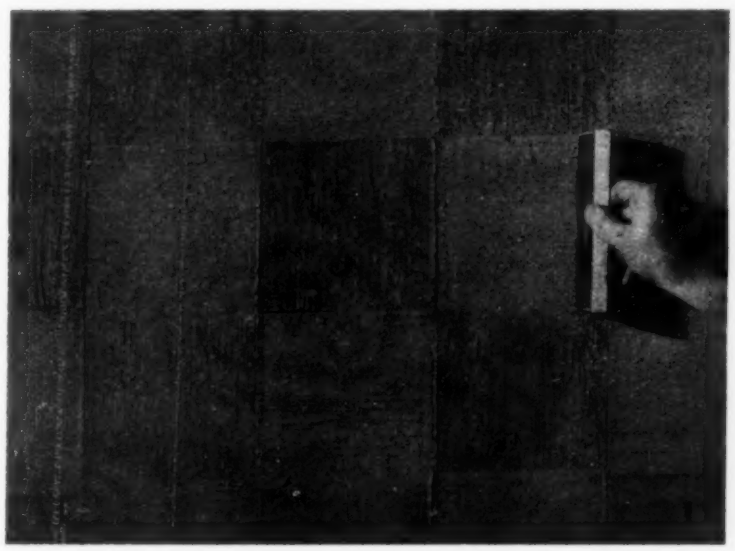


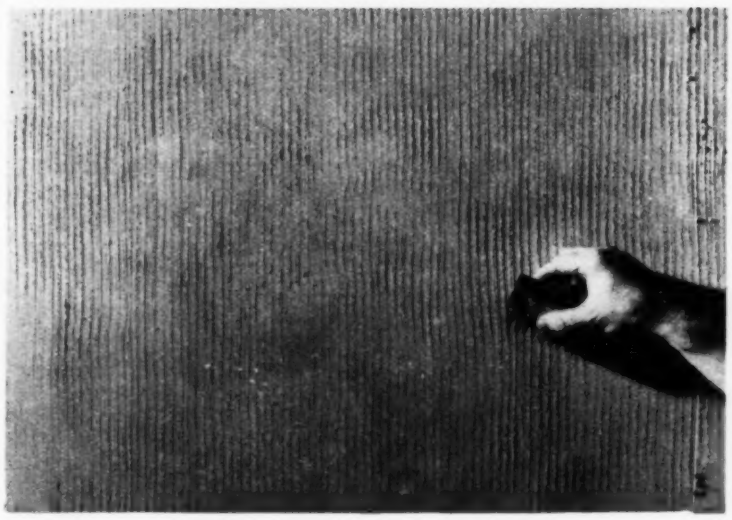
MAKING OF JOINT between panels of Sheetrock wallboard involves these four steps: (1) When sheets of wallboard are nailed in place the recessed edges form a channel at each joint. (2) Channel is "buttered" by filling with special cement which is quickly and easily applied. (3) Perforated fiber tape 2 3/16 in. wide, specially fabricated and beveled, is embedded in cement which oozes through perforations. (4) Surface of joint then is smoothed over and after drying is sandpapered evenly, assuring a smooth surface for any decoration.

SMALL TOOLS ON CONSTRUCTION

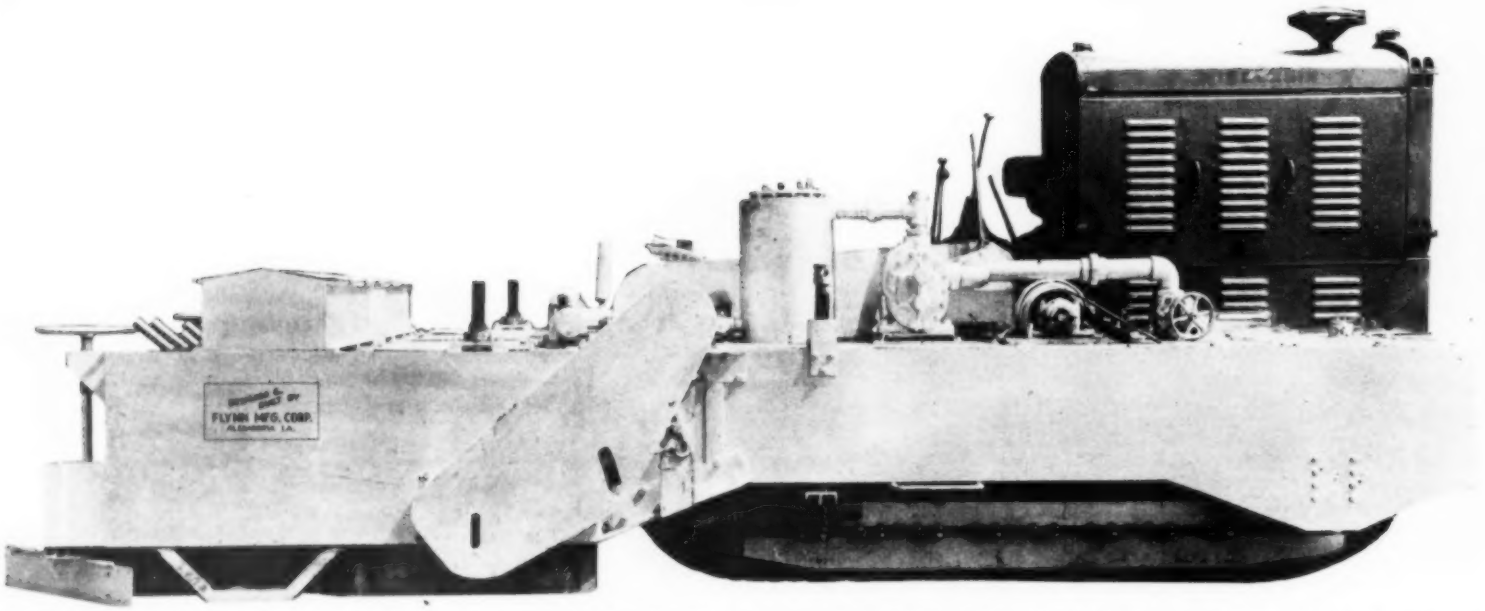
LINOLEUM KNIFE is handy tool for cutting Sheetrock, fireproof wallboard used in building construction.

LATHERS' HATCHET is indispensable tool in installation of Weatherwood reinforced insulating lath.





TEXTURES FOR WALL SURFACE coated with Textone, a plastic paint, may be produced by the following devices: (1) Steel comb of type used in grooming dogs is passed over surface horizontally and vertically to produce checkerboard effect. (2) Ordinary whiskbroom gives interesting wall textures when drawn over freshly coated surface in wavy lines. (3) Wire brush marks freehand vertical stripes on wall. (4) Trowel and hawk in hands of skilled plasterer produce pleasing effects.



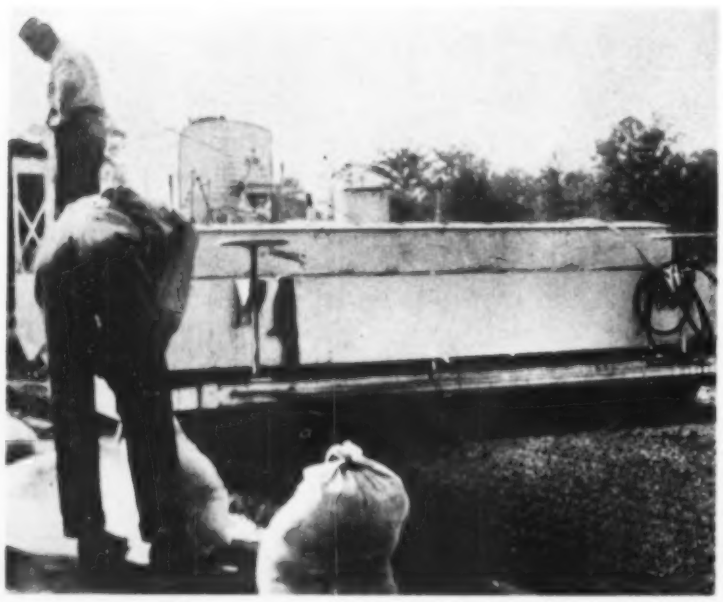
VERSATILE ROAD MACHINE, self-propelled on crawler tracks, is adaptable to many purposes from subgrading to soil processing. Rotary toothed cutters, pressure distributing bar, and tamping element, if desired, combine to make machine capable of cutting, pulverizing, spraying, mixing and compacting. By incorporating pan conveyor and cleanup blade, machine is adapted to subgrading.

ON SOIL-CEMENT CONSTRUCTION, tank truck supplies water to reserve tank on road machine. Similar means serve to supply bituminous materials on bituminous processed soil roads. Interstate Construction Co., Ocala, Fla., operates this unit on Georgia job.

Omnivorous Road Machine

THRIVES ON VARIETY

CHANGE OF DIET merely whets the appetite of a recently developed self-propelled road-building machine, which during 2 years' operation in many parts of the country has shown an ability to devour such dissimilar jobs as pulverizing and mixing of stabilized soil, processing of soil-cement and bituminous soil mixtures, shoulder finishing, subgrading, and trenching for pavement widening. Equipped with two rotary cutters for pulverization and mixing and with a pump and



PULVERIZED AND MIXED by rotary cutters and wetted by pressure spray of road machine, soil-cement mixture on this job is left untamped for compaction by proper rolling equipment.

CORRUGATED SURFACE of soil-cement treatment on Texas job shows effects of compaction by tamping element of machine. Tamper obtains satisfactory compaction to 4-in. depth. On other Texas work, Briggs-Killian Co., Pharr, Tex., has used early model of machine to build processed soil base with emulsified asphalt.

TRENCHING SHOULDER alongside existing slab for 3 ft. to 5 ft. of widening, Ohio Engineering Co., Lorain, Ohio, uses road machine with crawler tracks running on pavement and on completed trench grade behind cutters. Conveyor casts spoil on shoulder outside trench.

AFTER COMPLETING 2-FT. WIDENING of concrete slab, New Castle Duntile Co., of New Castle, Pa., utilizes machine to finish new shoulder, cutting ½ in. below former grade at outside edge of berm.

spray bar for pressure distribution of water or bituminous materials, the machine attacks varied types of soil-mixing and soil-processing jobs with equal facility. When desired, a tamping element is supplied with the machine to compact soil mixtures. For trenching and subgrading work the machine incorporates a pan conveyor delivering to one side or both sides of the unit. A cleanup blade feeds masticated spoil to the conveyor.

Embodying many features of the successful Flynn self-propelled subgrader which preceded it, the road machine of the same manufacturer has revolving cutters operated at high peripheral speed and designed for overcutting, on the down stroke, as contrasted with undercutting. Each cutter carries four rows of cutting teeth completely spiraled from end to end of a rotating shaft. Drop forged steel teeth with a 2-in. cutting face of wear-resisting metal are fastened in adjustable holders which may be set to desired cross-section and contour. The revolving cutter itself can be controlled vertically to govern depth of cut. Pan conveyors, for trenching and subgrading, part in the center of machine to deliver excess material to one or both sides.

On soil road construction, the machine can cut, pulverize, mix and add liquid material (water or bituminous admixture) in one operation to 8-in. depth at a speed of about 300 lin.ft. per hour for roadways up to 28 ft. wide. During this operation the machine makes two cuts, taking one-half the treated width in each cut, and overlaps the successive cuts about 2 in. to assure thorough mixing on the center line.

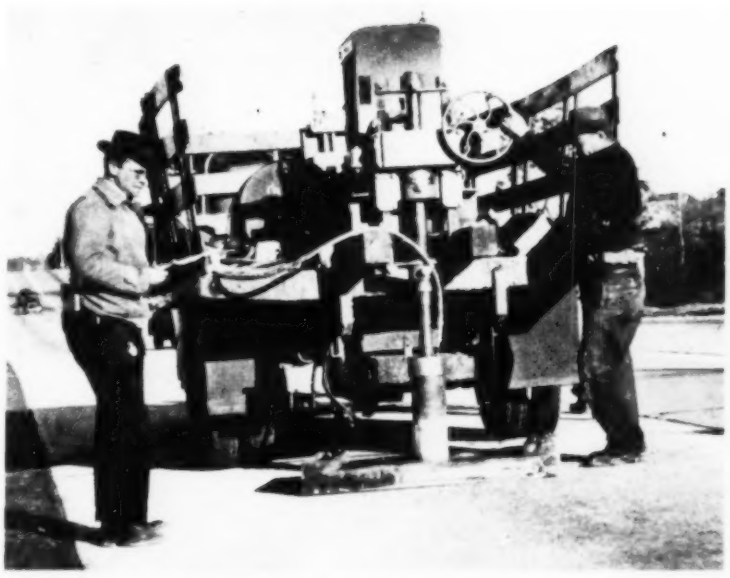
HIS MACHINE adds water, pulverizes and mixes soil-cement, explains BEN FLYNN (left), Alexandria, La., inventor and manufacturer, to W. S. TOMLINSON, city engineer, Columbia, S. C.

COST OF *Slab Cores*

DETAILED RECORDS of core drilling on 6 mi. of 12-ft. widening (using experimental concrete mixtures with various admixtures) at Scarboro, Me., about 5½ mi. west of Portland, gave an overall average cost of $2.10 per linear foot of test cores, including plugging the holes with concrete, for a total of 86 cores, or 60.3 lin. ft. of drilling, according to Charles F. Parker, engineer in charge of the project for the Maine State Highway Commission. The following averages were obtained *per linear foot of test cores:*

Core drilling rate	29.742 min.
Chilled shot used	1.694 lb.
Wear of steel bit	0.219 in.
Gasoline for drilling	0.466 gal.
Water for core drill	0.726 gal.
Core production rate	1.16 hr.
Cost of plugging holes (including materials)	$0.792

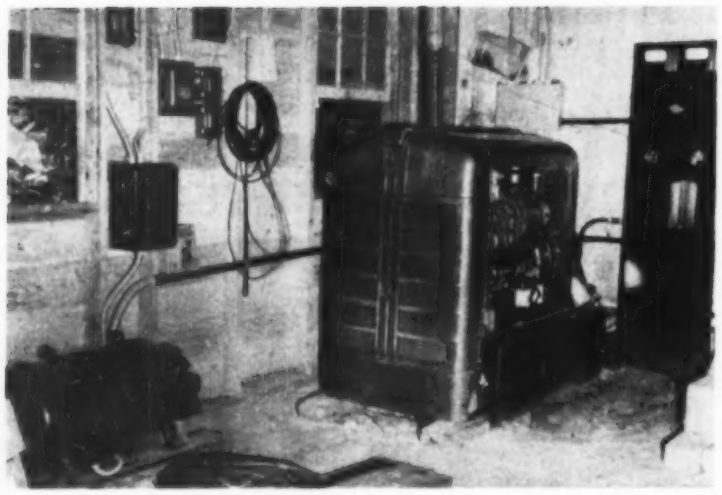
Average drilling progress per sharpening of steel bit was 23.15 lin. ft. of test cores.



CORE DRILLING MACHINE mounted on truck cuts 86 test cores from 9-7-9-in. slab reinforced with bar mats at two levels on Maine experimental concrete lane.

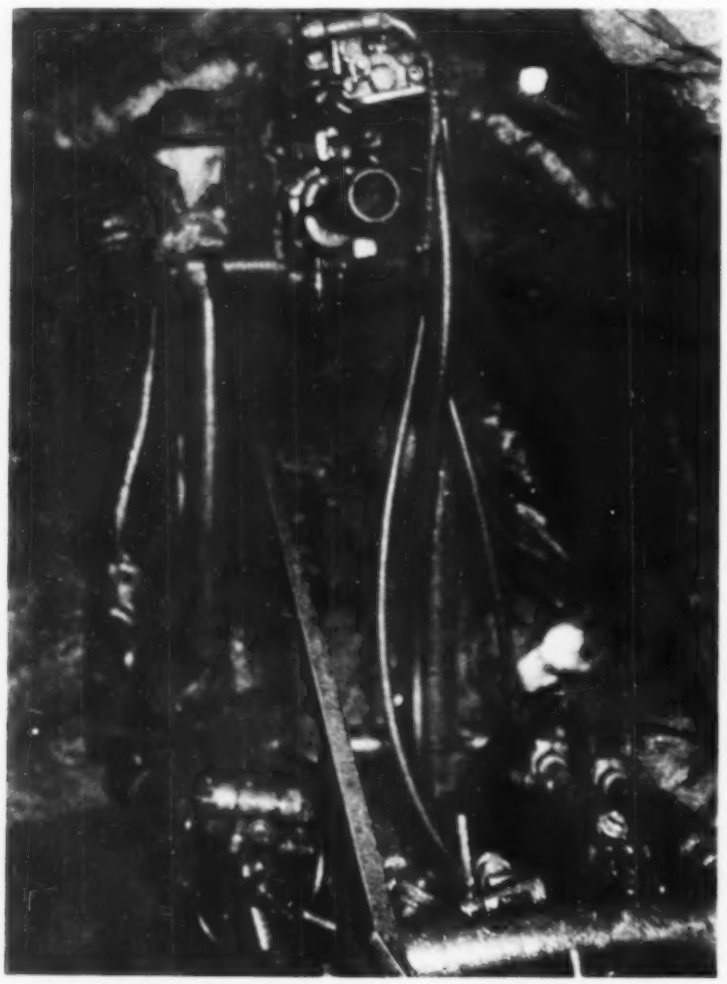
AFTER CHISELING circular groove in pavement surface and filling with chilled shot, crew moves core drill into position for drilling. Note slot in core drill; drill rotates in clockwise direction.

HARD-ROCK MINERS ADVANCE
Five Rounds Per Day
IN SMALL-BORE TUNNELS

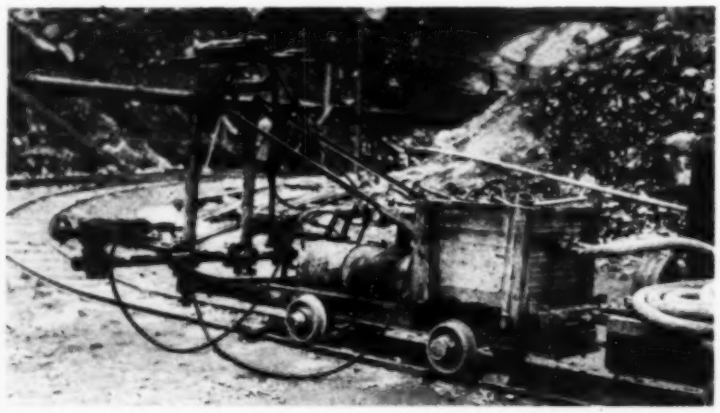


DIESEL-ELECTRIC GENERATOR of 60-kw. capacity produces electric power needed for tunnel construction operations. On panel at right is voltage regulator which reduces 220 v. a.c. output of generator to 110 v. for lighting circuit. On floor at left is 15-hp. motor-generator set which converts a.c. power to d.c. for charging storage batteries used by tunnel locomotives.

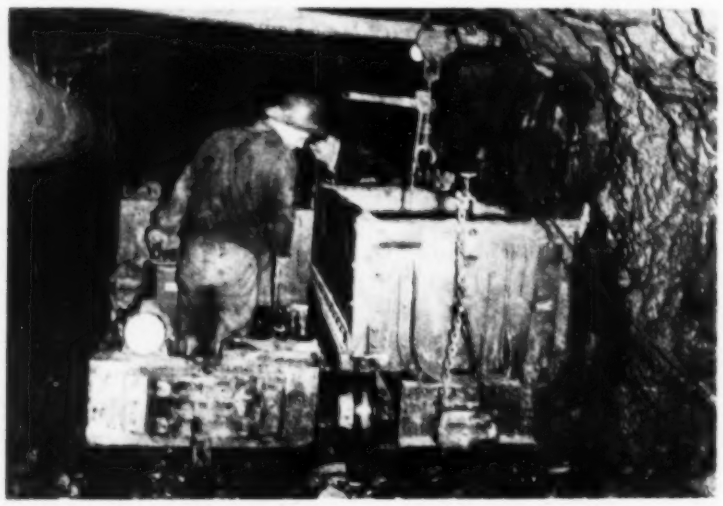
DETACHABLE DRILL BITS are changed in shop outside tunnel to assure accurate choice of bit gages and save time in heading. Bits are resharpened three times; they make 18 in. of drilling between sharpenings.



ONLY TWO DRILLS are operated at one time in heading, which is too small for effective employment of three drill runners and helpers. Swivel side arm at lower left has been folded back against carriage. Third drill is mounted on jumbo for convenience in reaching top holes.

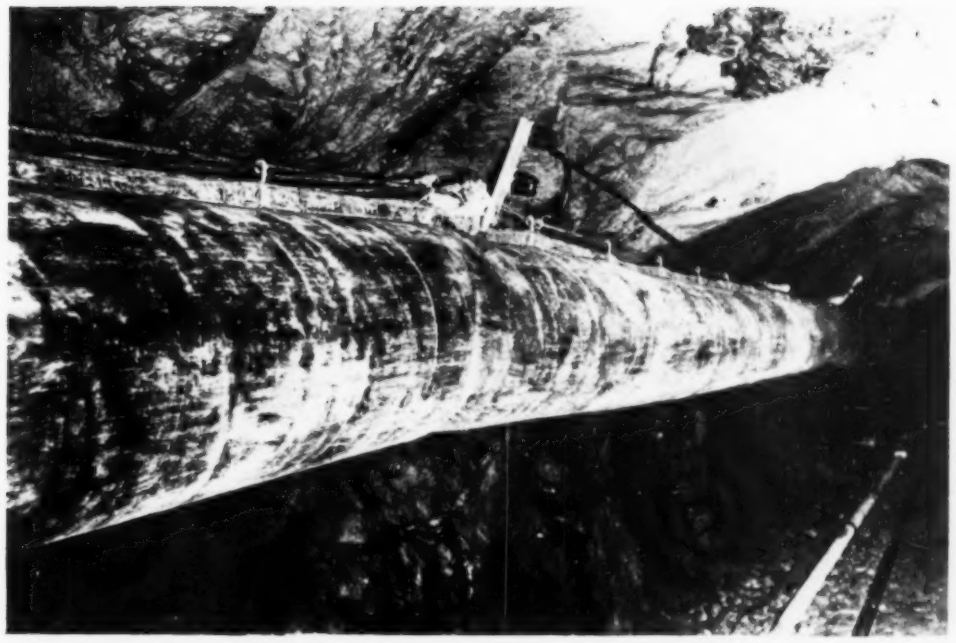


DRILL JUMBO traveling on 24-in.-gage tunnel track carries three motor-feed wet drifters. Bull hose delivers air to small receiver equipped with manifold for hose connection to three drills.



TROLLEY-HOIST CHERRY-PICKER lifts empty muck car clear of track to permit passage of storage battery locomotive. After locomotive has pulled train past this point, empty car will be replaced on track to be pushed up to mucking machine in heading.

ALL CONSTRUCTION WORK on Saugatuck development of Bridgeport Hydraulic Co. is directed by WILLIAM C. MERRILL (left), superintendent, standing beside D. O. O'CONNOR, shifter.

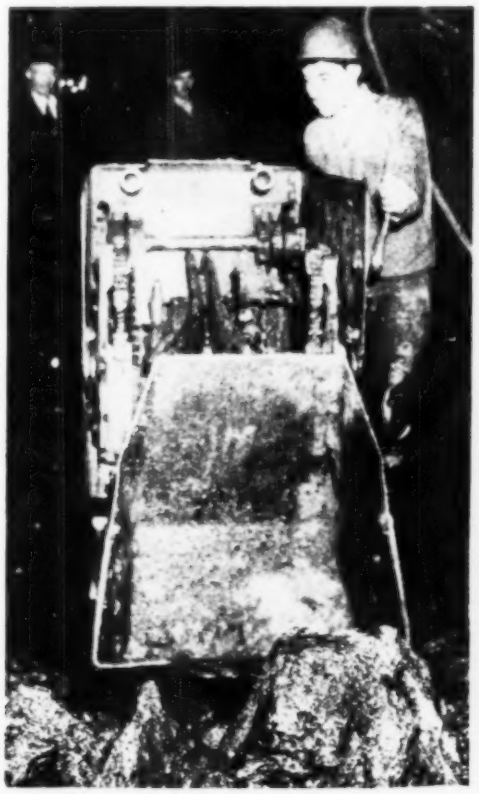


CARRYING 2,500 C.F.M. OF AIR at 1-lb. pressure, fabric ventilating tube dilates to full 16-in diameter. High-pressure air line is laid on shoulder of tunnel invert.

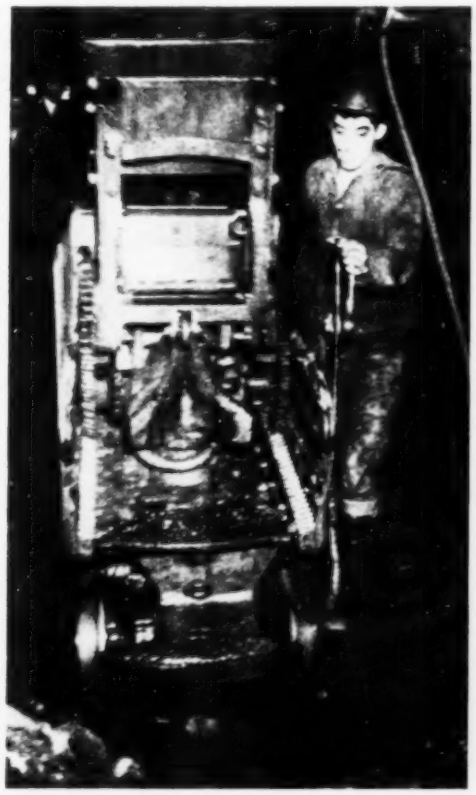
ORGANIZED AND EQUIPPED to drive 7-ft. 8-in. horseshoe tunnel through hard gneiss at a scheduled rate of 120 ft. per six-day week, day-labor crews of the Bridgeport, Conn., Hydraulic Co. are employing modern machines and methods to drill, blast and muck five 6-ft. rounds every 24 hr., stepping up the progress to an average of 170 to 180 ft. per week, with a maximum of 200 ft. Urged on by a bonus incentive for any advance in excess of 120 ft. per week, the tunnel crews rapidly completed the driving of a 1,300-ft. bore, in which they were first engaged, and transferred their operations to a 6,600-ft. tunnel through a parallel ridge separated from the first by a narrow valley. The two tunnels are to be lined with 8 in. of concrete, reducing them to 6-ft. 4-in. horseshoe section, to carry water which will be delivered from a new reservoir on the Saugatuck River to an existing water supply system north and west of Bridgeport.

Following established policy, the water company augmented its permanent skeleton force by engaging experienced constructors to direct the work of build-

(Continued on page 104)



AIR-POWERED MUCKING MACHINE controlled by operator standing on small attached platform lowers 4-cu.ft. bucket preparatory to crowding it forward into muck pile. Note large fragments of broken rock in foreground.



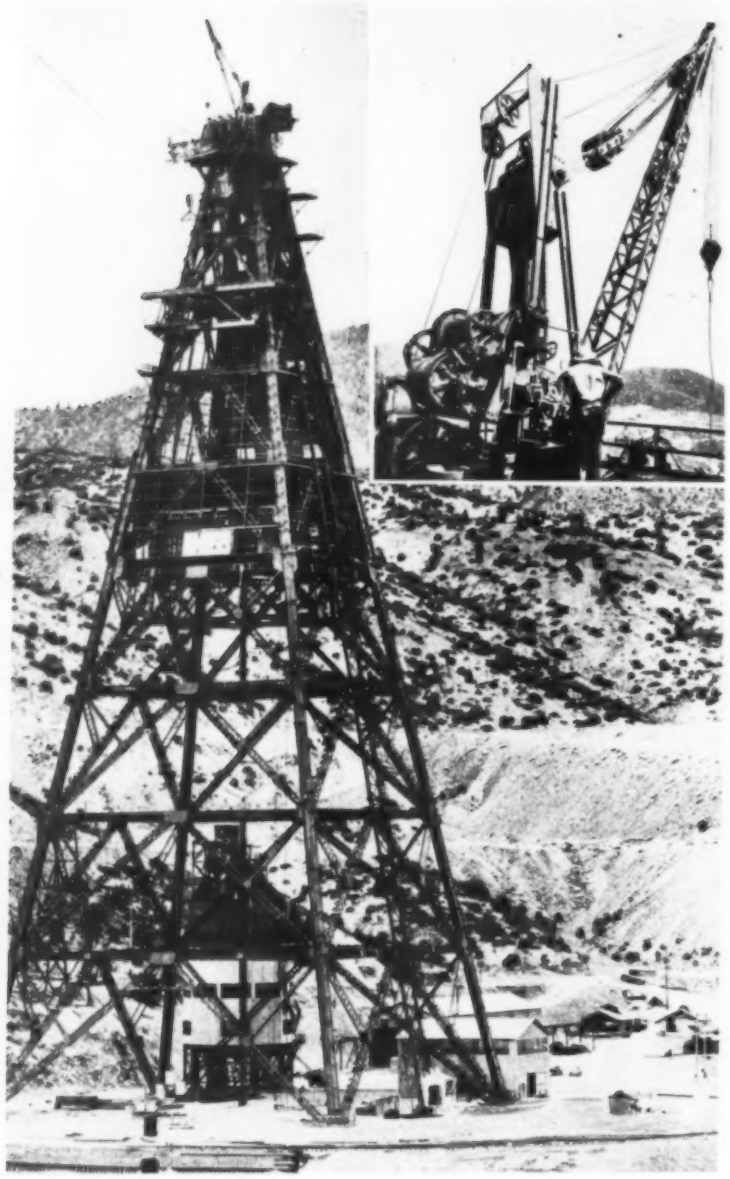
AFTER USING CROWD MOTOR to fill bucket, operator manipulates hoist throttle to raise broken rock and cast it into attached muck car at rear of mucking machine.

CONSTANT WETTING of muck pile by hose spray helps to keep down dust during mucking operation in tunnel

HOW They Did It

CONSTRUCTION DETAILS

For Superintendents and Foremen



HEAVY-DUTY PILLAR CRANE is mounted atop 460-ft.-high steel cableway head tower at Shasta dam, in California, to service cableway and tower elevator. Self-slewing electric-powered American unit for Pacific Constructors, Inc., has welded steel boom 47½ ft. long and pillar of welded structural steel. Capacity 15 tons at 25-ft. radius and 3 tons at 48½-ft. radius. Hook speed is 11 ft. per minute. Rig includes blocks and sheaves for 25-part boom line and 7-part load line. In addition to 7½-hp. slewing motor, equipment includes 15-hp. double-drum electric crab.

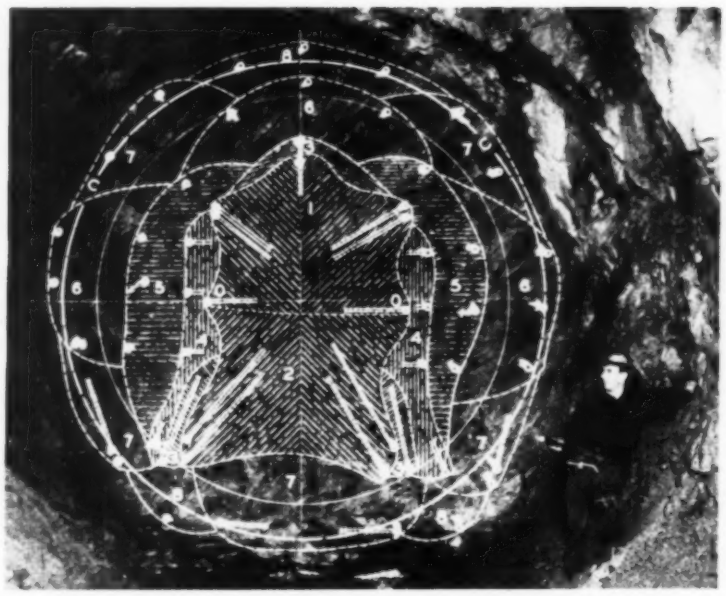
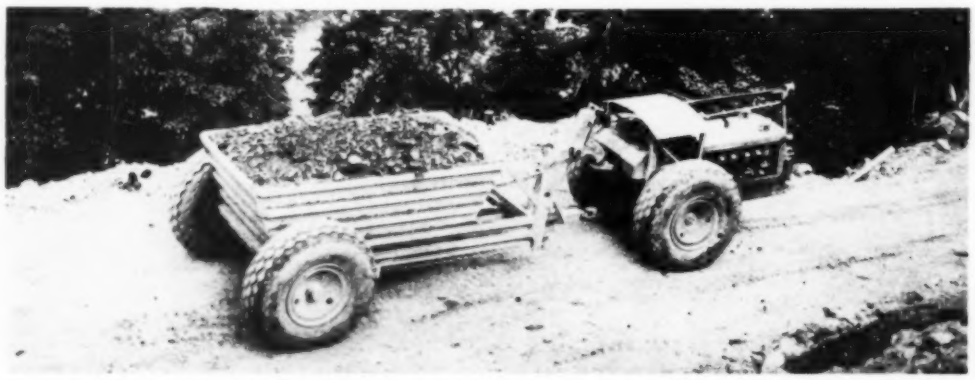


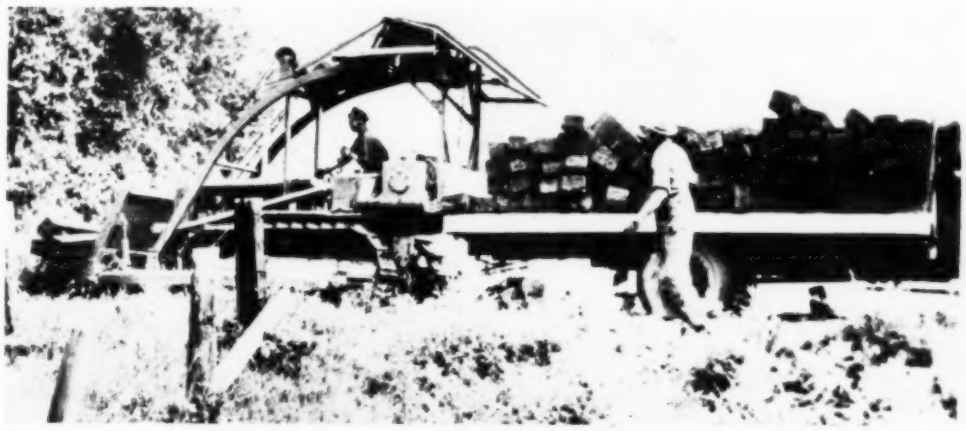
DIAGRAM OF FULL-FACE DRILLING of rock tunnel, 15 ft. in finished diameter, for New York City's Delaware River aqueduct is superimposed on photograph of bore being driven for Board of Water Supply by Frazier-Davis Construction Co., for whom Robert Ellis (in lower right corner of picture) is superintendent. To aid plotting of diagram, white papers were stuffed into ends of 54 holes constituting round after they were loaded. Primers of different delays broke down face of tunnel as indicated by numbers, as follows: Cut holes marked "O" go off instantly; successively the holes included within the inclosing areas "1", "2", "3" to "8" are fired, with about ½ to 1 sec. difference in timing. As explained by Theodore R. Johnson, of Water Board's engineering staff, delayed firing loosens each rock layer with minimum resistance and concentrates muck within distance of 30 to 50 ft. from face, expediting removal by mucking machine. Drill holes ranged in depth from 11 to 13 ft. Using 425 lb. of explosives per round in sound gneiss, powder factor was 4.2 lb. per cubic yard of blasted rock.

ROAD WIDENING MACHINE cutting 4-ft. strip for new pavement along edge of existing slab has rotating cutter bars carrying teeth which have been hard-faced for longer wear and greater sharpness with Amsco self-hardening chromium-molybdenum-high carbon steel welding rod. Buckeye road widener travels on pavement.

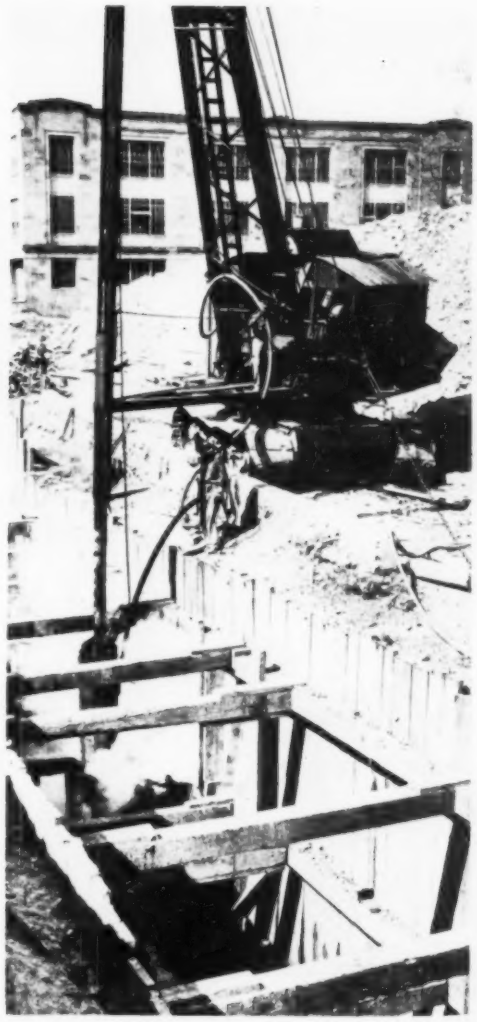


HAULING 30 HEAPED YARDS per trip, pneumatic-tired Tournapull tractor powered by Caterpillar 160-hp. diesel engine takes Tournatrailer up average 4 per cent adverse grade on 1¼-mi. one-way haul for Harrison Construction Co., Pittsburgh, which operates two of these units on highway relocation at Johnstown, Pa. To control fill slope when dumping, rear end of bottom-dump body is projected over edge of fill and discharge of material is regulated to form desired slope.

CONVERTED TRUCK, stripped of body and equipped with relocated steering post and controls at side of chassis, provides flat carrier for convenient delivery of reinforcing steel by J. Phillip Murphy Corp., San Francisco, to spillway of Mud Mountain Dam, Wash.

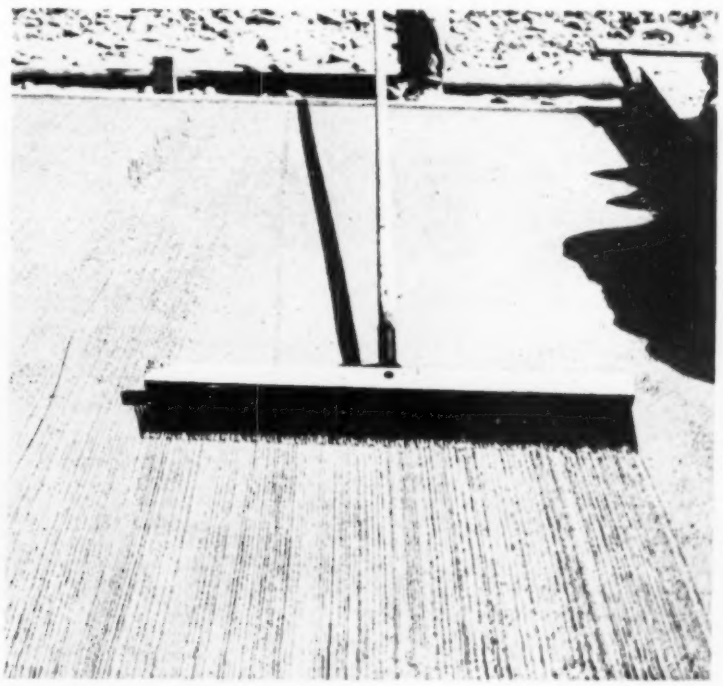


REMOVING TIES from abandoned railroad, Athey Mobiloader mounted on wide-gage Caterpillar 35-hp. diesel tractor is equipped with two-prong wedge-shaped fork, instead of standard bucket, and with flat chute at rear to allow ties to slide on to truck attached by cable to tractor drawbar. Machine handles six to ten ties in one loading operation and enables V. H. Carroll, contractor, Cedar Rapids, Iowa, to clear 1 mi. of right-of-way per day.



SLIDING HAMMER LEAD running in angle guides on fixed vertical lead of piledriver allows 7,000-lb. hammer to follow piles into trench on Washington, D. C., sewer contract of Stiers Bros. Construction Co., St. Louis. Sliding lead is 6-in. W.F. beam 17 ft. long operating in track on 8-in. W.F. fixed lead 35 ft. high.

DURING ARMY MANEUVERS at Camp McCoy, Wis., 11,000-lb. tractor-shovel unit rides on pneumatic-tired trailer wheels with truck convoy at speeds up to 35 m.p.h. Versatile Hough hydraulic shovel mounted on Allis-Chalmers 31-hp. gasoline tractor builds ammunition roads and river approaches, digs tank traps and loads shale, sand and earth into trucks. Equipped with backfiller blade, unit operates as bulldozer to clear ammunition trails.



BROOMS WITH STEEL BRISTLES make continuous, sharply defined transverse grooves in freshly finished concrete pavement in Oregon, providing non-skid quality and reducing night glare, according to 2 years' experience in this state. In wet weather, grooves break up water film which otherwise would act as surface lubricant and light reflector.

HE LARGEST TRACTOR-SCRAPER FLEET

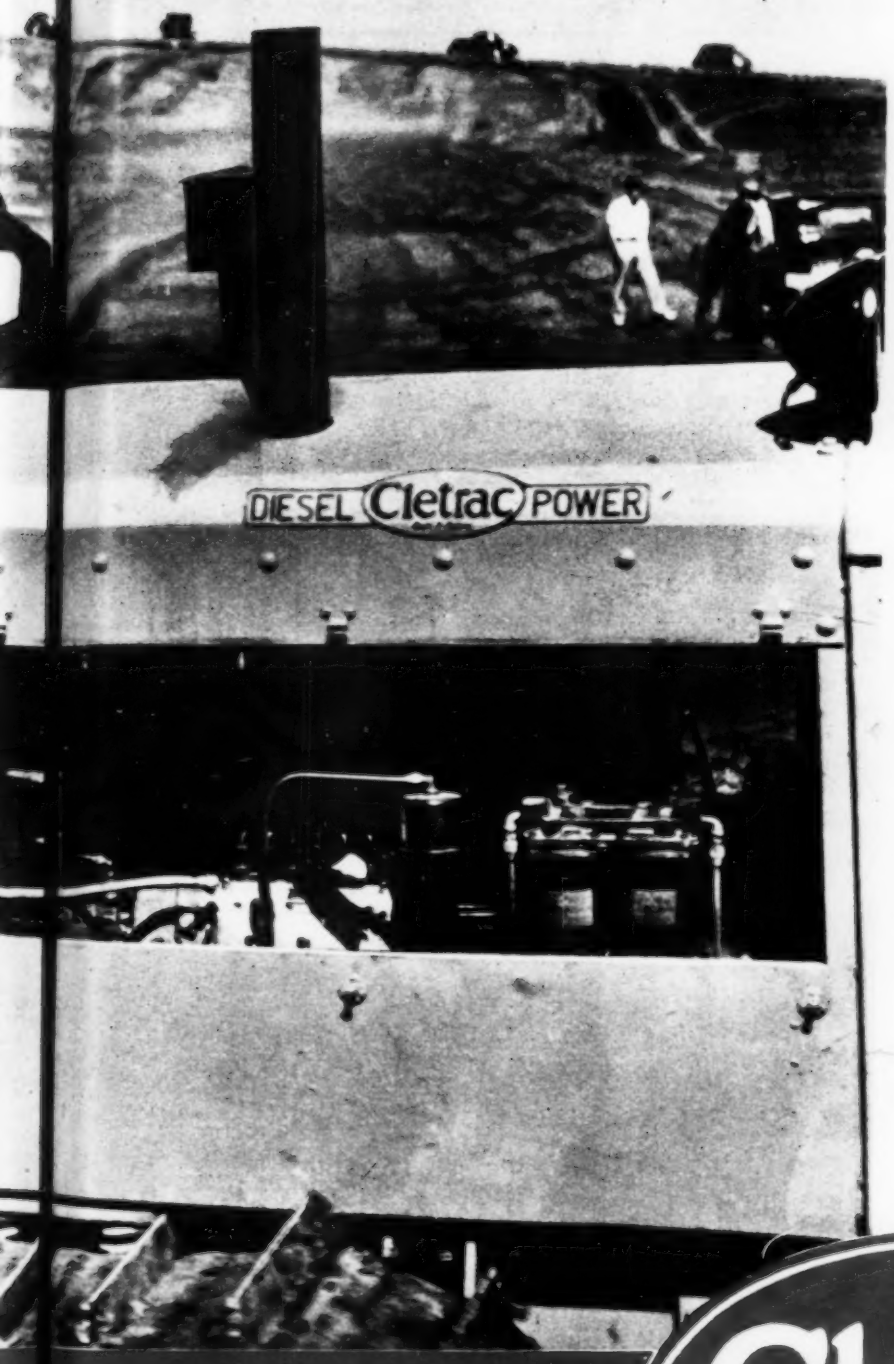
ON THE 60 MILLION DOLLAR PENNSYLVANIA SUPER HIGHWAY

re dirt moved in 20 months on this job than in building the Panama Canal.
e biggest road building program in the history of the world.

2 CLETRACS ON THIS 24 MILLION YARD JOB

TRU-

-TRACTION



—only Cletrac Tractors have it!

Tru-Traction is controlled differential steering (the type used on most military crawler type vehicles), Tru-Traction means power on *both tracks at all times*—power that is dependable in getting you through those tough spots without stalling or miring down. Power that can be used when turning at high speeds without jack-knifing. Power that will do your job better—will put you safely inside deadlines, and put more money in your pocket.

CLETRACS HAVE:

1. Power on both tracks at all times.
2. Higher protected clearance.
3. Triple sealing against mud and grit.
4. Easier service and quicker adjustments.
5. Electric starting for diesel and gasoline engines.

Cletrac
Crawler Tractors
REG. U.S. PAT. OFF.

TWO SPEEDS REVERSE

Cletracs speed up every operation in dirt moving, bulldozing, loading or shoveling. Their multiple speeds forward and their 2 speeds reverse enable you to shuttle back and forth faster. Cletracs give more production time for push or pull and have less lost time in empty back-up or haul-back.

THE CLEVELAND TRACTOR COMPANY

Cleveland, Ohio

CLETRAC CRAWLER TRACTORS • 14 TO 96 H. P. GASOLINE OR DIESEL

SLENDER SECTIONAL SCAFFOLD 75 ft. high carries 74,000-lb. load during erection of limestone blocks in pediment. Four blocks weighing 8,000 to 14,000 lb. each have been raised to scaffold platform. Note tubular truss, bridging 21-ft. span over balcony, and tubular putlogs bracing scaffold from stone columns.

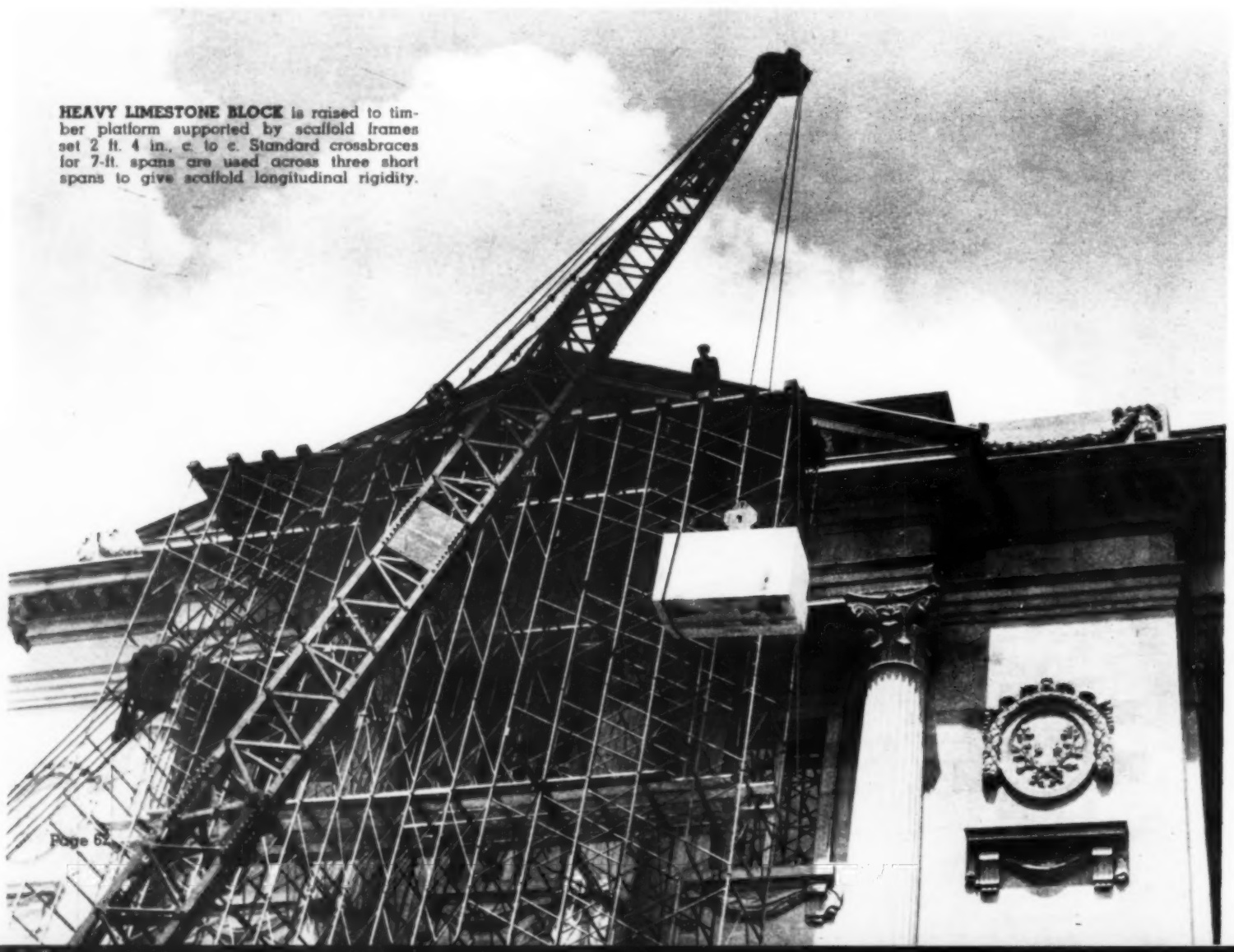
Tall Steel Scaffold

SUPPORTS 37-TON LOAD

SECTIONAL STEEL SCAFFOLDING 75 ft. high supported loads up to 74,000 lb. during erection of heavy Indiana limestone blocks by the National Stone Setters Co., Philadelphia, for John T. McShain, Inc., general contractor, in the east and west pediments of the Philadelphia municipal court house. The entire scaffold was made up of standard Safway units, including a tubular truss which spanned a distance of 21 ft. over a balcony on the second floor of the court house.

To support the heavy load of pediment stone, effective span between scaffold frames was reduced to 2 ft. 4 in., presenting something of a problem in horizontal bracing. Secure anchorage was obtained by butting tubular putlogs against stone columns of the court house and by tying the scaffold frames with heavy wire loops to the columns. Standard crossbraces for 7-ft. spans were employed across three 2-ft. 4-in.

(Continued on page 112)



HEAVY LIMESTONE BLOCK is raised to timber platform supported by scaffold frames set 2 ft. 4 in., c. to c. Standard crossbraces for 7-ft. spans are used across three short spans to give scaffold longitudinal rigidity.

RAISED TO VERTICAL POSITION as unit, sidewalls for barracks buildings are first framed while lying flat on ground.

TILT-UP METHOD is employed by contractor for raising to place prefabricated timber frames for sidewalls of Army barracks.

Building Barracks

AT FORT DIX, N. J., IS

Rush Job

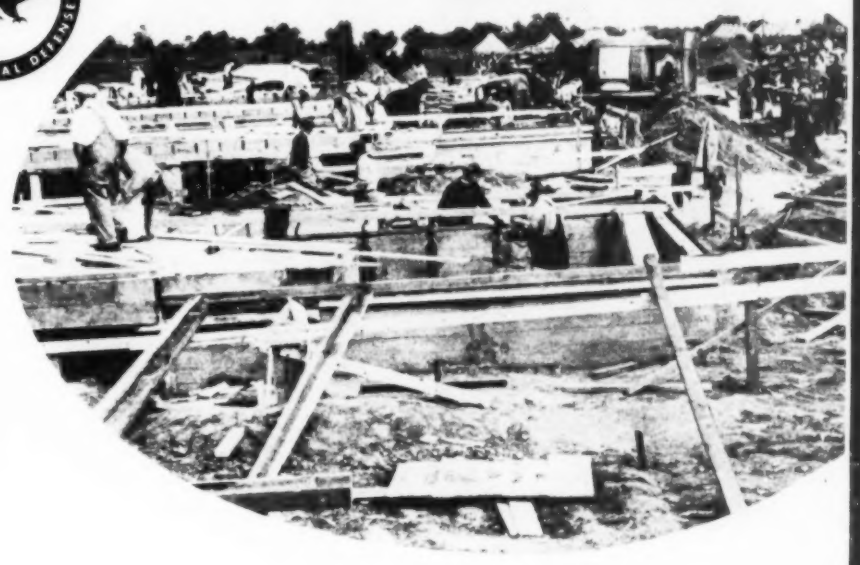
CONSTRUCTION OF LIVING FACILITIES, including barracks, mess halls and auxiliary structures, with completion date set at Nov. 28, is being rushed at Fort Dix, N. J., camp for about 15,000 National Guardsmen and 5,000 potential conscripts of the United States Army.

Of the 852 wood buildings under construction, 550 will be barracks. These barracks will be modernized structures with two floors. Each one will be heated by hot air and have a separate heating plant. Sixty-three men can be accommodated in each building.

The mess halls will accommodate 1,000 men and are made up of a central unit 75x32 ft. and two side units 130x32ft. The roof trusses of these buildings incorporate split-ring timber connectors in all joints.

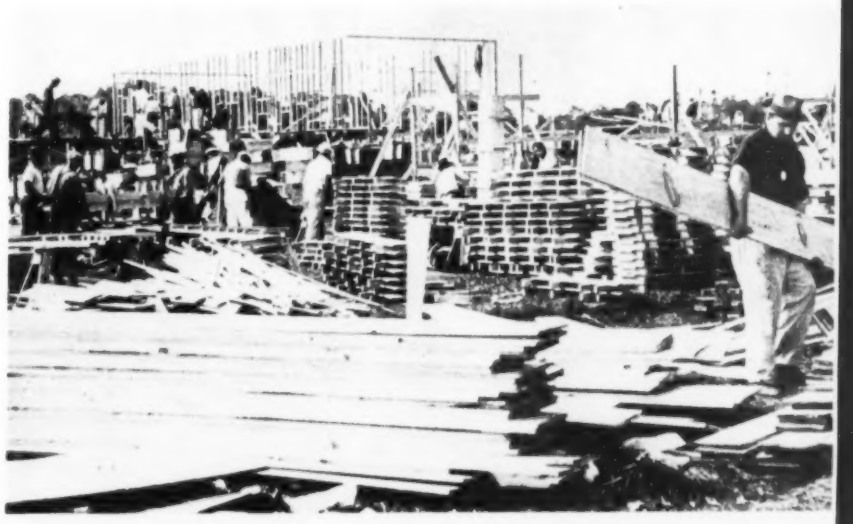
The contract for the construction of these camp units, awarded by the War Department to the George A. Fuller Co., of New York City, calls for the expenditure of $5,571,-000. Under a supplemental contract of $1,713,400, a 1,000-man hospital and two 1,000-man capacity post theatres will be built, plus new roads, sewer-pumping stations and extension of electric power.

When completed Fort Dix will have facilities to house 20,000 men.



FOUNDATIONS for Army camp buildings are concrete delivered by truck-mixers.

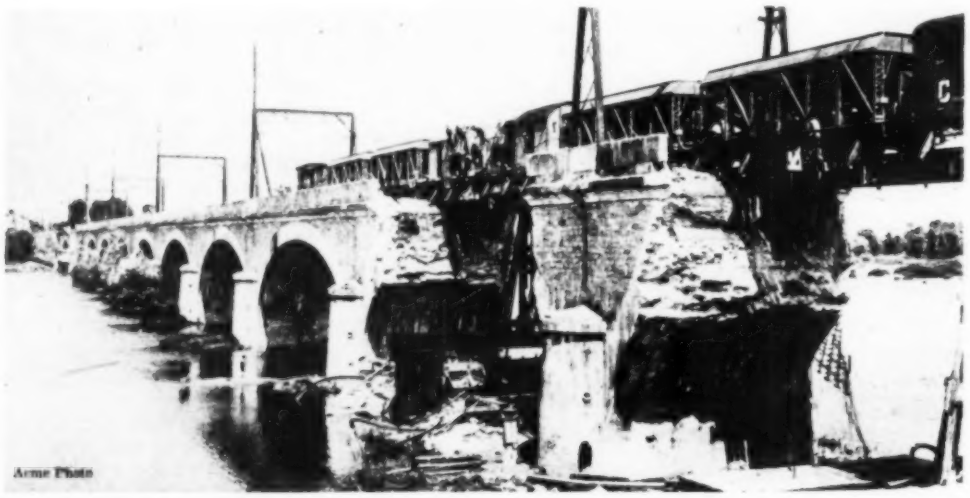
DETAILS OF FRAMING (left) are shown in this view of timber wall of barracks building, prefabricated flat on ground and raised as unit into vertical position.



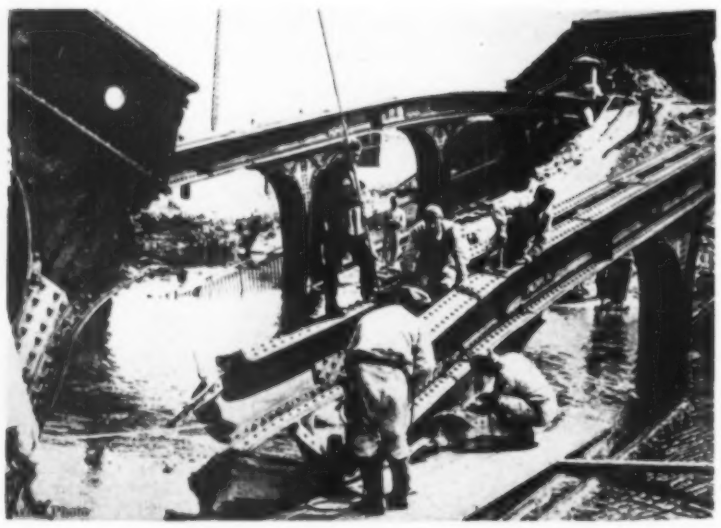
LUMBER IN HUGE QUANTITIES is delivered at Camp Dix, N. J., for construction of 852 buildings, including barracks and mess halls.

LONDON'S BOMB DISPOSAL UNIT uses tripod frame and block and tackle to remove from hospital grounds 1,200-lb. time bomb dropped by Nazi plane during night air raid.

SHOTS FROM *War Zone*



SHATTERED SPANS of bridge across Loire River at Tours, France, are restored to service by temporary repairs made by Geman forces prior to rebuilding masonry arches.



IN WAR DEVASTATED AREAS German engineer troops are engaged in restoring essential municipal services. Here a crew equipped with cutting torch is at work on wreckage of steel bridge somewhere in Belgium. (Photo passed by German censor.)

BRITISH ARMY ENGINEERS receive training "somewhere in England" in operating equipment for building and repairing roads, digging trenches and transporting earth for defense construction projects.

CONCRETE PLANT SETUP at street level includes dual-drum 34-E paving mixer equipped with long boom to enable bucket to discharge directly into agitating hopper of Pumpcrete machine, connected by pipe line to subway tube.

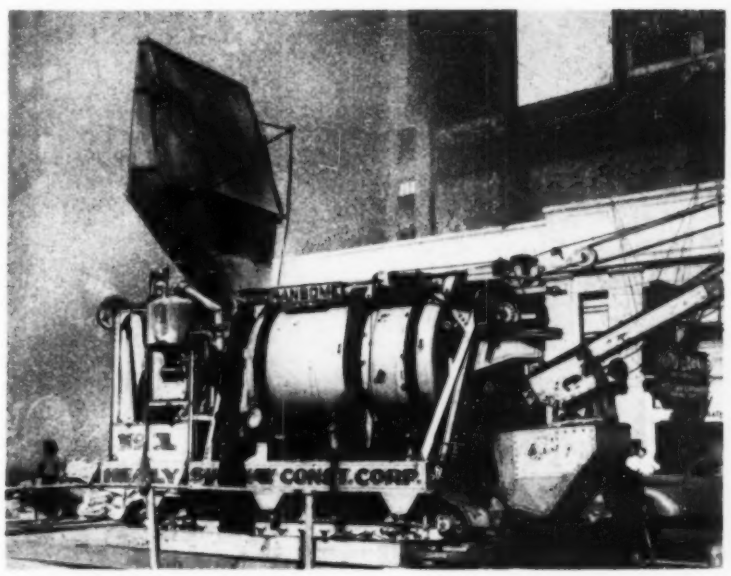
Pumped Concrete

FOR CHICAGO'S SUBWAY

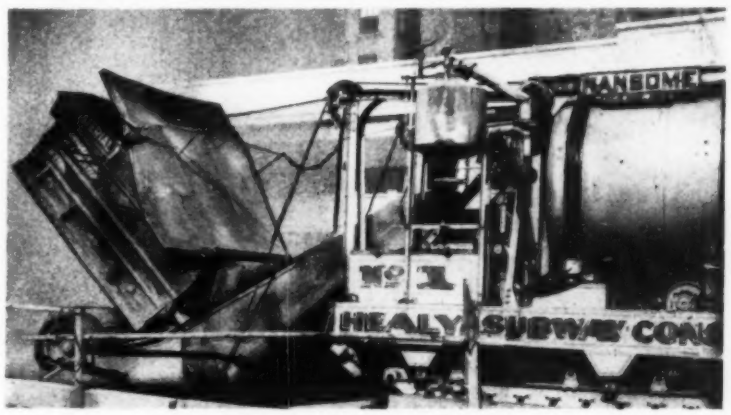
UNION OPPOSITION HAS PREVENTED the use of ready-mixed concrete on construction projects in Chicago, Ill. and has required the mixing of all concrete on the job. The accompanying photographs show the concrete plant setup installed and operated by the Healy Subway Construction Co. on its Dearborn St. contract.

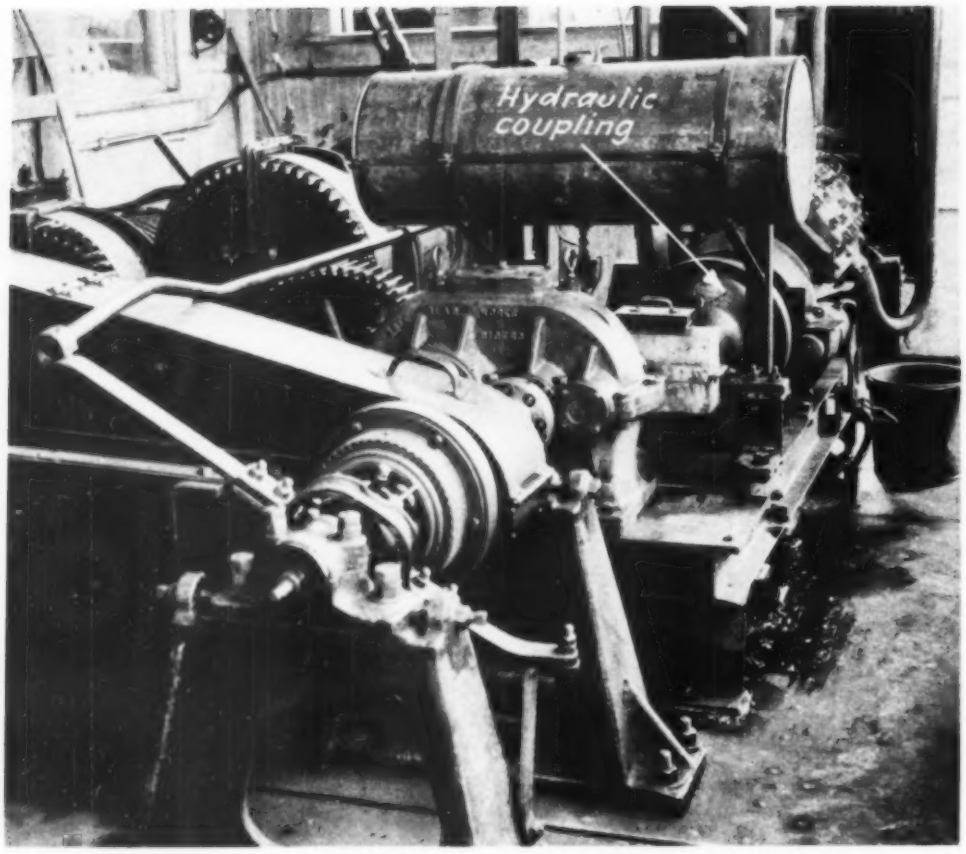
The contractor is using a Ransome dual-drum 34-E paving mixer equipped with a long boom carrying a bucket that discharges directly into the agitating hopper of a Chain Belt Pumpcrete machine. The concrete then is pumped through a pipe line tapping the subway tube, which is being driven under compressed air by the shield method. The concrete, therefore, must be pumped against the air pressure within the tube.

A feature of the plant setup to prevent loss of cement is a dust screen over the charging skip of the mixer. This device is a hood of canvas and wood that fits over the skip when the latter is raised for discharging into the mixer drum. As the skip is lowered, the dust screen, tied by cables to the top of the mixer frame, is automatically lifted to provide clearance for the batch trucks. This rig prevents cement dust from being blown through heavily traveled Dearborn St.



CEMENT DUST SCREEN, consisting of canvas on wood frame, is rigged on mixer skip so as to close when skip is raised to discharge into drum **(above)** and open **(below)** when skip is lowered for charging by batch truck delivering stone, sand and cement.





HYDRAULIC COUPLING installed in shaft system between gasoline engine, in background, and gear box, in foreground, provides easy starting and flexible power transmission, saving wear on cables and on drum clutches of winch.

Hydraulic Coupling

IMPROVES WINCH CONTROL OF FLOATING SWING BRIDGE

TO OBTAIN COMPLETE THROTTLE CONTROL, free from engine stalling and clutch manipulation, of the gasoline-powered winch drive on a floating swing span which carries 130th St., Chicago, across the Calumet River, the Bridge Division of the city's Bureau of Engineering installed a hydraulic coupling in the shaft system between the engine and the gear box that delivers power to the winch. By its characteristics the coupling not only permits flexible throttle control of bridge movement without engine stalling, but also eliminates jerking of cables and burning of clutches. Drum clutches of the winch remain under full application throughout the starting and swinging of the bridge.

Winch machinery for swinging the bridge is mounted on the pontoon which supports the floating end of the 105-ft. span. A Ford V-8 engine drives an O.K. Clutch & Machinery Co. double-drum winch through a Brad Foote gear reduction, as illustrated by an accompanying photograph. The hydraulic coupling, supplied by the Hydraulic Coupling Division of the American Blower Co., is of the self-contained traction type used in many other applications such as shovels, draglines, cranes and trucks.

Hydraulic Coupling

Briefly described, the hydraulic coupling is an oil-filled unit which transmits power entirely by hydraulic means (without any mechanical connection whatever) from the engine shaft to the driven shaft. A vaned saucer-shaped wheel, or impeller, mounted on the engine shaft, performs as a pump to deliver oil to a similar wheel, called the runner, mounted on the output shaft; the runner is driven in a manner similar to a water wheel. A cover, inclosing the back of the runner and retain-

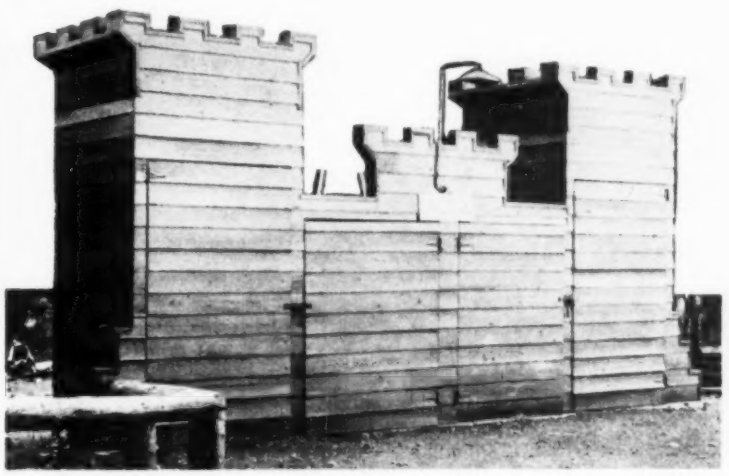
(Continued on page 115)

PONTOON SWING SPAN 105 ft. in length is maneuvered into open and closed positions by cables running to winch machinery in house on pontoon at right. Span rotates around corner socket on abutment at left.

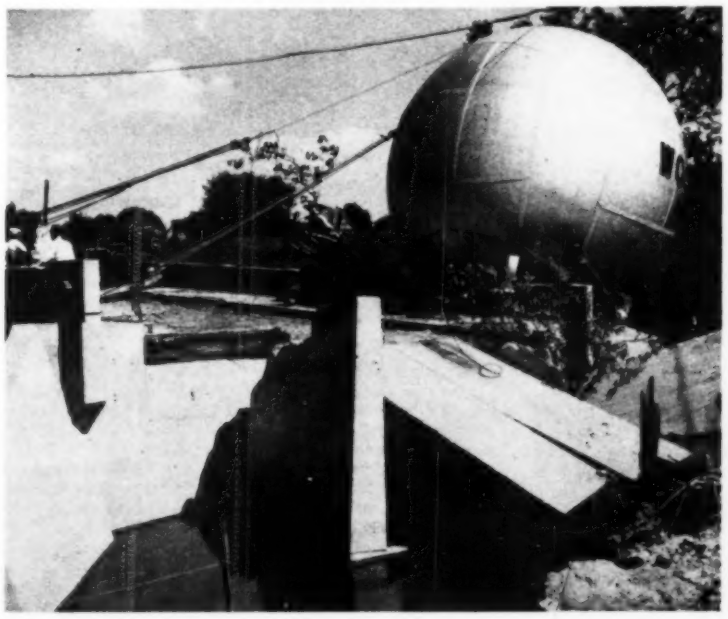
JOB oddities

"THROWING THE BULL" is subject of statuette being presented as golf trophy to Henry Hale (left) eastern division sales manager for Caterpillar Tractor Co., by Henry Howard, company's engine sales manager, following inter-company golf match between teams of Caterpillar and Thew Shovel Co. at Lorain, Ohio. Hale is reported to have "talked a winning game of golf but at last moment had to cancel plans for participating in match. Seizing upon this defection from Caterpillar ranks, his rivals in Thew organization conceived idea of statuette showing a golfer swinging a bull, instead of a club, over his shoulder. Trophy is inscribed: "To Henry Hale, Champion Golfer by Fear and Default, from Thew Shovel Co." This journal is unable to report which team won match, as a rigid censorship was clamped down on any discussion of golf scores by members of two companies.

EARTH MOVING CONTEST in which prominent construction men operated shovels and wheelbarrows, featured annual clambake of The Moles, New York organization of men engaged in tunnel, subway, marine, or other heavy construction. Awards were made to contest winners and outstanding men in The Moles field of work, including John Macdonald of Walsh Construction Co., Pete Gallagher of Gallagher Bros. Sand & Gravel Co., Henry Hesterberg, commissioner, Board of Water Supply of New York, and R. M. Johnson of Madden & Lane, Long Island City. Officers of the organization are Ray N. Spooner, New York City, contractor, president; Ralph W. Atwater, Shultz Dredging Co., Hoboken, N. J., and Alexander Lyle, chief engineer of the Carleton Co., New York City, vice-presidents; Alex M. Stagg, Jersey City, N. J., secretary.



OFFICIAL INSIGNIA of Corps of Engineers, U. S. Army, a turreted castle, is reproduced in housing fire station at Mud Mountain dam, Army engineer project consisting of 425-ft.-high rock fill with earth core in narrow gorge on White River near Seattle, Wash. Construction of dam by Guy F. Atkinson Co. is under direction of Col. B. C. Dunn, district engineer, U. S. Engineer Department.



THIS BUBBLE didn't break but bridge did. A spherical gas holder carried away by flash floods in Woodstown, N. J., Sept. 1, plugged channelway, and dammed water washed out reinforced concrete highway crossing.

PILE-DRIVING FREAK occurred when steel H-beam, put down with Vulcan hammer by Poirier & McLane Corp. on Atlantic Ave. track depression job in Brooklyn for Long Island Railroad, struck concrete sewer. Flange of steel pile sheared off, penetrated sewer and curled up inside like a watch spring.

Present and Accounted For

A PAGE OF PERSONALITIES

ON SUNNYDALE HOUSING PROJECT in California, described in this journal last month, H. V. GRANT (left) is resident engineer for San Francisco Housing Administration and H. J. BRUNNIER is consulting structural engineer.

NEW ORLEANS CONTRACTOR has been named a member of New Orleans, (La.,) Housing Authority. J. GORDON LEE was associated with O. M. Gwin Construction Co. from 1919 to 1937 and since then headed his own company.

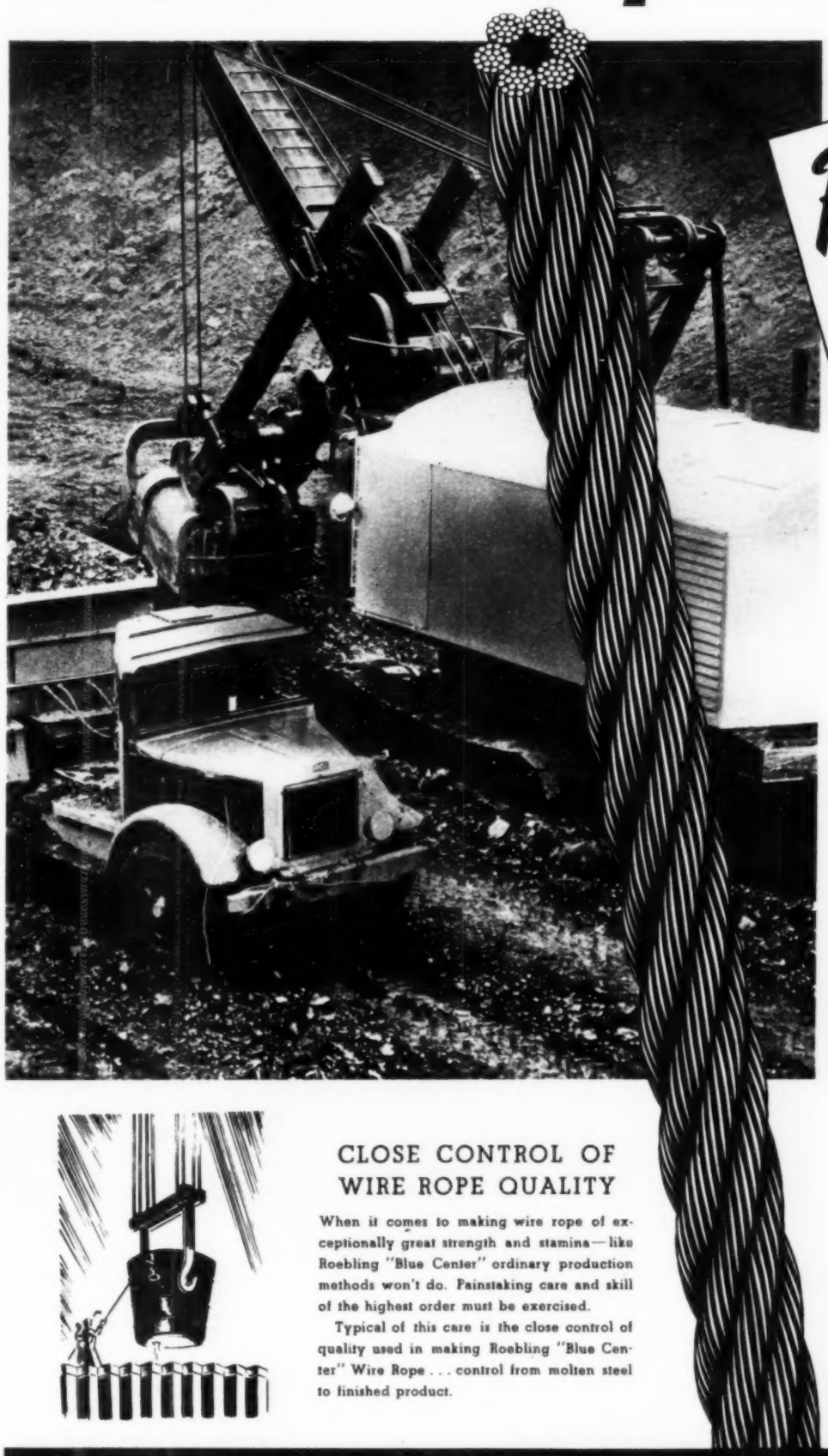
AS PROJECT MANAGER for Cherokee dam on Holston River, 33 mi. from Knoxville, Tennessee Valley Authority has selected LEE G. WARREN to direct construction on $65,000,000 project for additional power. Measuring 170 ft. in height, dam will have concrete gravity section 1,825 ft. long and 4,800 ft. of earth embankments. Mr. Warren was formerly project manager on TVA's Chickamauga and Watts Bar dams.

PROTECTION OF CIVILIANS and safeguarding of municipal service facilities in time of war is being studied by a committee of American Society of Civil Engineers. WALTER D. BINGER, Commissioner of Borough Works, New York City, has been named by Col. John P. Hogan, president of society, as chairman of new committee.

DEFENSE CONSTRUCTION for U. S. Army will be new responsibility of HARRY W. LOVING, of Charlotte, N. C., formerly secretary of Carolinas Branch of Associated General Contractors of America. Mr. Loving, a graduate of Georgia Tech, will head a new branch of Construction Division of The Quartermaster Corps, under Brig.-Gen. C. D. Hartman, dealing with defense construction carried out by War Department under cost-plus-fixed-fee contracts.

NEW CHIEF ENGINEER of U. S. Bureau of Reclamation is SINCLAIR O. HARPER, appointed on recommendation of Commissioner John C. Page by Secretary of the Interior Harold L. Ickes to fill vacancy created by recent death of R. F. Walter. Mr. Harper has served with the bureau for 33 years, most recently as assistant chief engineer in Denver office and as acting chief engineer. He is a civil engineer graduate of University of California.

Greater Safety...Longer Life



Roebling
"BLUE CENTER"
WIRE ROPE
STANDARD OR PREFORMED

If it's lower rope cost per cubic foot of earth moved that you want—maximum safety for workers—lowest wire rope replacement cost—then Roebling "Blue Center" is the rope for you.

Nearly 100 years of wire fabricating experience have gone into the development of Roebling "Blue Center" Wire Rope. It is Roebling's highest achievement in wire rope manufacture. Specially developed, through years of research, to provide maximum rope durability, safety and economy—Roebling "Blue Center" has established unexcelled records for long, low cost service.

Use Roebling "Blue Center" on all your shovels, scrapers, drag lines and other rope-rigged equipment. Keep accurate service records. Compare. We are confident you will agree with other users—that Roebling "Blue Center" assures the utmost of safety—and lowest rope replacement cost.

CLOSE CONTROL OF WIRE ROPE QUALITY

When it comes to making wire rope of exceptionally great strength and stamina—like Roebling "Blue Center" ordinary production methods won't do. Painstaking care and skill of the highest order must be exercised.

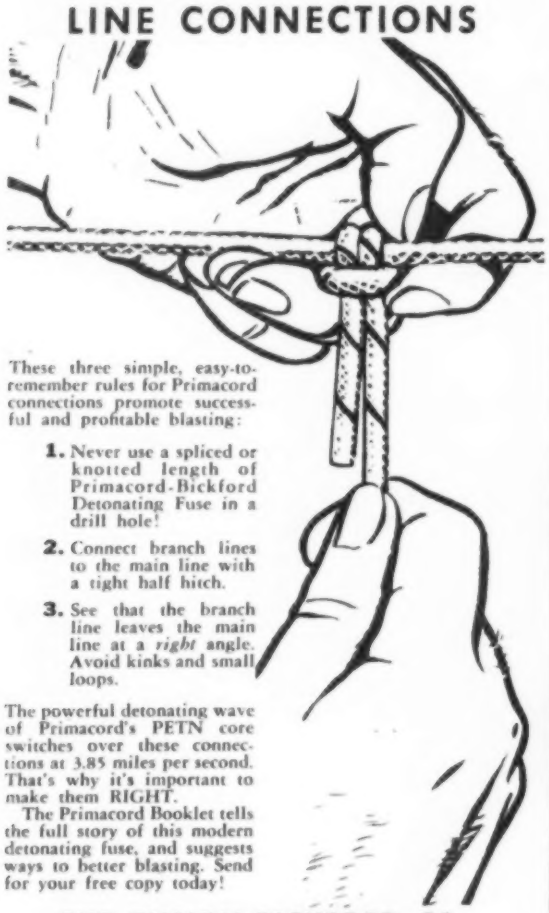
Typical of this care is the close control of quality used in making Roebling "Blue Center" Wire Rope . . . control from molten steel to finished product.

JOHN A. ROEBLING'S SONS CO.
Trenton, N.J. Branches in Principal Cities

ROEBLING "BLUE CENTER" The Finest of all Roebling Wire Ropes

THE HALF HITCH IS *right*

FOR MAIN TO BRANCH LINE CONNECTIONS



These three simple, easy-to-remember rules for Primacord connections promote successful and profitable blasting:

1. Never use a spliced or knotted length of Primacord-Bickford Detonating Fuse in a drill hole!
2. Connect branch lines to the main line with a tight half hitch.
3. See that the branch line leaves the main line at a *right* angle. Avoid kinks and small loops.

The powerful detonating wave of Primacord's PETN core switches over these connections at 3.85 miles per second. That's why it's important to make them RIGHT.

The Primacord Booklet tells the full story of this modern detonating fuse, and suggests ways to better blasting. Send for your free copy today!

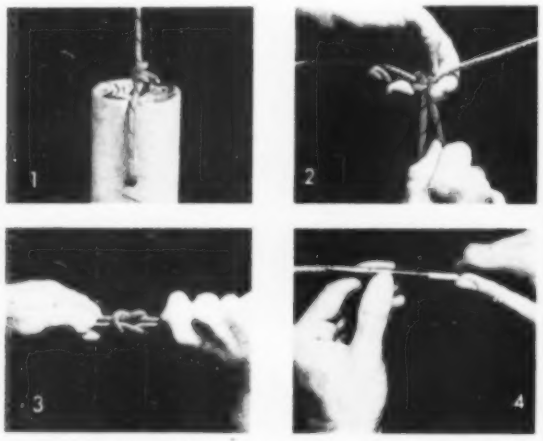
THE ENSIGN-BICKFORD CO.

Simsbury, Conn.

Makers of Cordeau-Bickford Detonating Fuse — and Safety Fuse since 1836

PRIMACORD-BICKFORD *Detonating* FUSE

PB-27



1. Tie through cartridge.
2. Half hitch branch to main line.
3. Connect main line lengths with square knot.
4. Fuse and cap on end of main line.

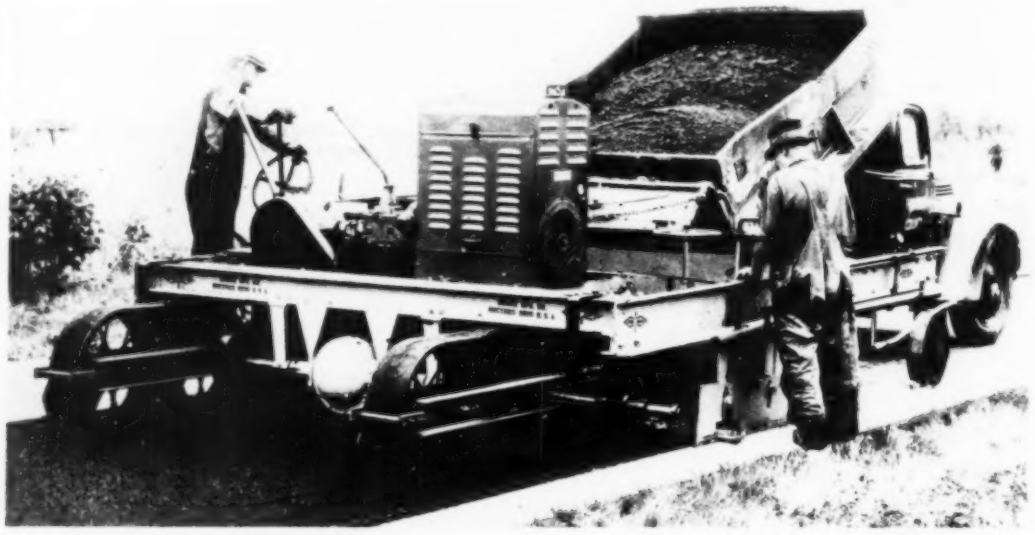
Important: Branch lines should lead away from main lines at *right angles*. Avoid kinks and small loops.

CONSTRUCTION EQUIPMENT NEWS

(ALL RIGHTS RESERVED)

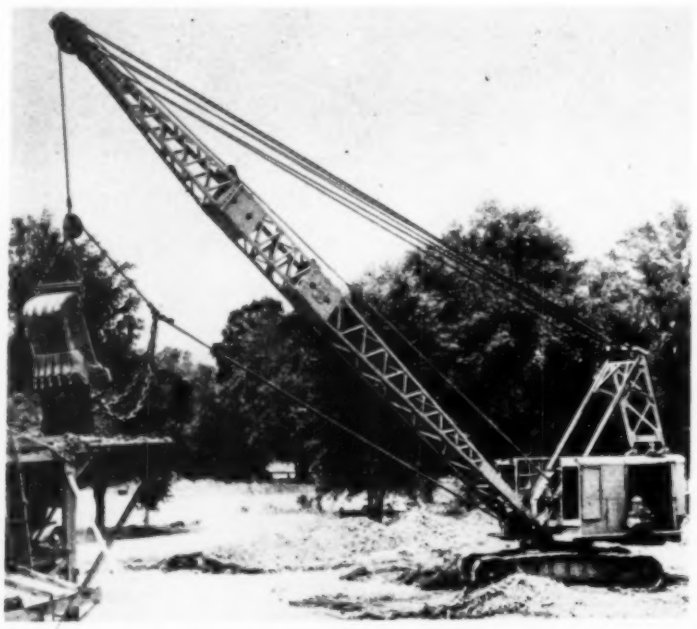
Review of Construction Machinery and Materials for NOVEMBER 1940

POWER-DRIVEN SPREADER AND FINISHING MACHINE said to be able to lay smoothly finished mat of surfacing material over badly worn and rutted roads and streets without preliminary scarifying of old surface or filling of holes. Machine rides over new surface on two crawler-type wheels equipped with



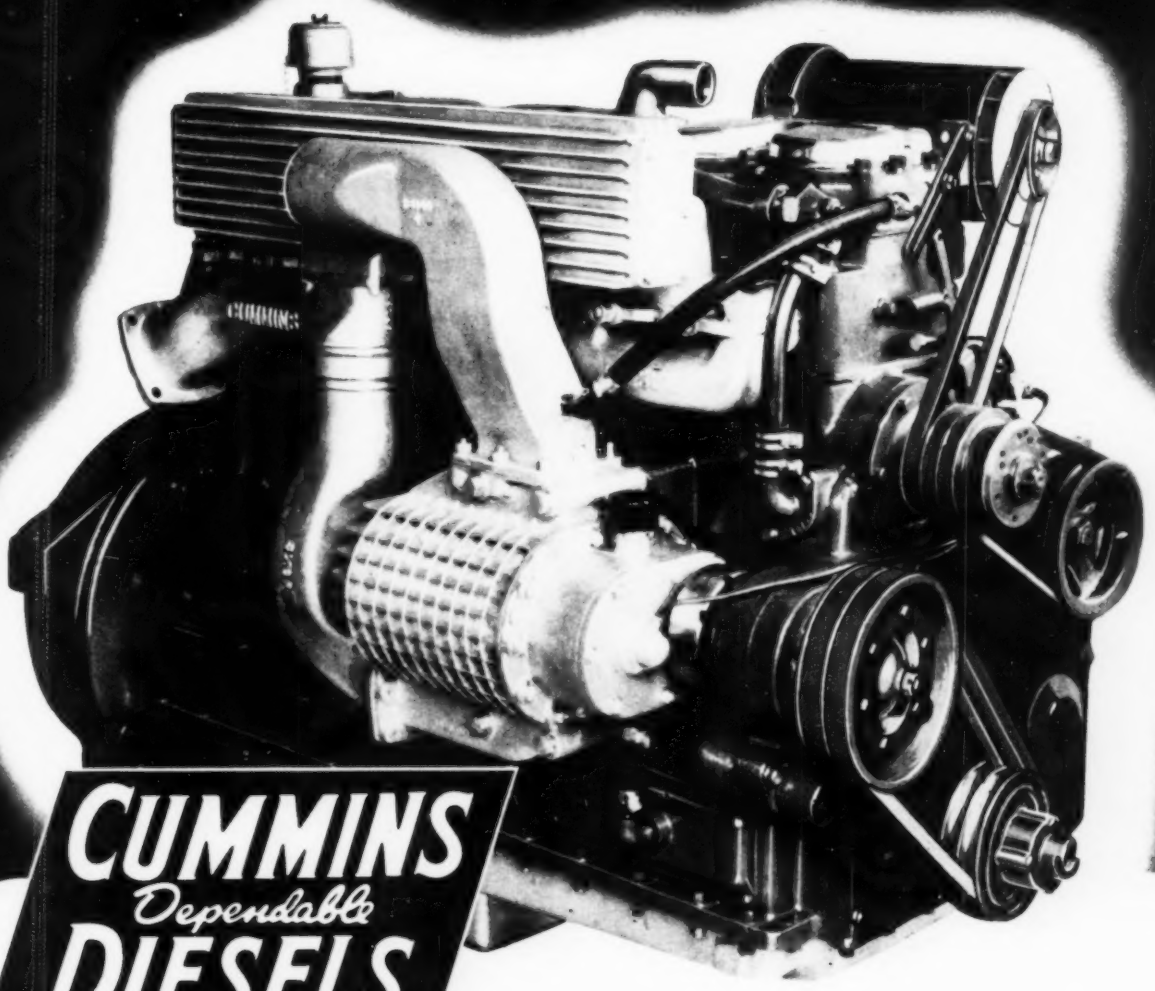
smooth belt treads and located immediately behind oscillating finishing screed, thus nullifying effects on new surface of bumps in old road surface. Either front wheel may be set to run at level above or below opposite wheel to compensate for differences in subgrade or old surface. Extra wheels provided for transportation of machine. Powered by 4-cylinder, water-cooled, industrial-type motor. Drive is through truck-type transmission and separate transverse which furnishes five speeds both forward and reverse. Two of three wheels in crawler unit driven by truck-type differential.—**Shunk Mfg. Co., Bucyrus, Ohio.**

★ ★ ★



LONG RANGE EXCAVATOR with booms up to 80 ft. long with high A-frames and buckets up to 3 cu.yd., is convertible for dragline, clamshell, lifting crane or piledriving operation. Said to offer high line, easily controlled speeds, exceptional mobility, stability and low ground pressure; to be especially suited for operation with long booms. Recommended for use on large drainage projects, coal mine and quarry stripping, canal excavation, material handling service, piledriving, lifting and placing large concrete forms, handling concrete buckets and steel erection. Features: (1) All machine movements controlled from operator's position in cab; (2) double band clutches; (3) renewable, quickly replaceable drum barrels; (4) specially designed boom foot fairlead with direct lead to drum to reduce drag cable stresses; (5) reduced hoisting cable wear effected by use of large swiveling type boom point fairlead, eliminating binding of cable regardless of bucket position; (6) automatic tagline control, permitting accurate spotting of clamshell bucket and materials; (7) highly responsive clutches and positive brakes provide accurate boom control. A-frame raised or lowered by power without use of other machine. Diesel or gasoline powered. Lifting capacities for two models range from 44,000-51,800 lb. at 20-ft. radius to 8,300-9,500 lb. at 70-ft. radius. Machine said to climb 30 per cent grades with ease.—**Koehring Co., 3026 W. Concordia Ave., Milwaukee, Wis.**

A PROVED "PAY TOOL"*



CUMMINS *Dependable* DIESELS

*Example: David W. Johnson, Inc., Newark, N. J., are using four 13-yd. Cummins Diesel-powered Euclid Trac-Truks to handle 800,000 yards of dirt on their White River flood control project in Indianapolis. Supt. Herbert Allison says: "Cummins Diesels do the job they are cut out to do. They have plenty of guts . . . we haven't lost a minute because of engine trouble."

*Model HBS-600 (supercharged) Cummins Dependable Diesel. 200 hp. at 1800 rpm.

● When a construction man labels any piece of equipment a "pay tool", he means it is doing a profitable, dependable job. The Cummins Dependable Diesel is a proved "pay tool" because it does the job cheaper, faster, longer . . . on the biggest and toughest contracts . . . in all types of power machinery. Why cheaper? Because the Cummins Diesel makes a gallon of fuel last longer . . . because the Cummins Diesel costs less to maintain. Why faster? Because the Cummins Diesel has the high torque, the power to hold on in tough going . . . because the exclusive Cummins Fuel System provides supreme flexibility. Why longer? Because the Cummins Diesel is precision-built from highest quality materials to assure maximum strength and stamina. Give your equipment peak "pay tool" performance. Specify Cummins Diesel power. A complete line from 40 hp. to 500 hp. Cummins Engine Company, 1716 Wilson Street, Columbus, Indiana.

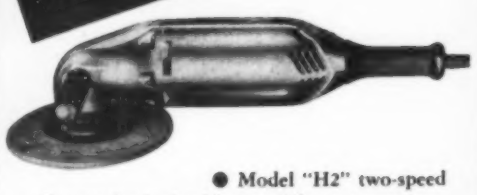
SKILSAW DRILL

½ INCH—MODEL 80

...a better all-around tool for wood boring in tight places

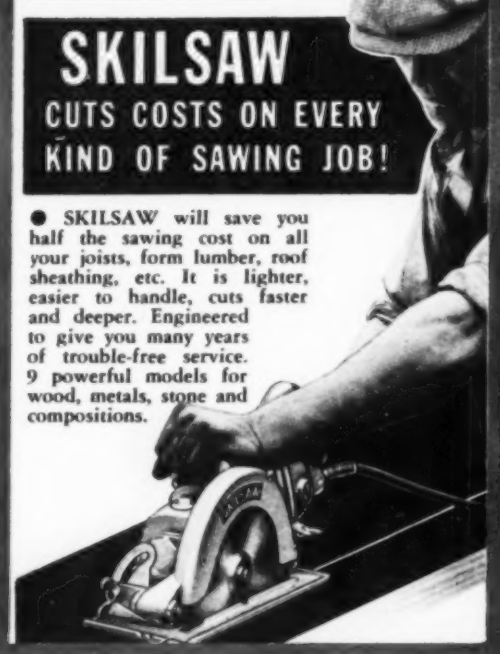
● This new 100% anti-friction bearing ½ inch drill is a mighty handy tool to have around on every type of construction job. Ideal for boring in close quarters where the usual ½ inch drill cannot get in — capacity in hard wood is 1¼ inches. Perfect balance and light weight makes it easy to use in any position — plenty of power for toughest jobs. SKILSAW DRILLS are made in 21 models for drilling holes up to 2 inches, to a depth of 18 inches. There is a size for every need.

SKILSAW DISC SANDERS make toughest grinding jobs easy!



● Model "H2" two-speed disc sander is the ideal tool for concrete construction work. Use it at 4200 R.P.M. for cleaning off the concrete from your forms — then, fitted with concrete grinding wheels, use it at low speed for removing webbs and general concrete surfacing. Powered for every kind of job. Also 5 other powerful models.

SKILSAW CUTS COSTS ON EVERY KIND OF SAWING JOB!



● SKILSAW will save you half the sawing cost on all your joists, form lumber, roof sheathing, etc. It is lighter, easier to handle, cuts faster and deeper. Engineered to give you many years of trouble-free service. 9 powerful models for wood, metals, stone and compositions.

NEW! Pneumatic SKILSAW!

● The most famous portable circular saw is now available for operation by air. Rips and cross-cuts timbers up to 4 in. full; bevel-cuts lumber 3-5/16 in. thick at 45°. Ideal for cutting terra cotta. Special governor regulates speed, reduces air consumption. Poppet-type throttle valve is leak-proof, cuts off air instantly. Safety lock on throttle prevents accidental starting. 12 inch blade, free speed 1200 R.P.M.

SKILSAW

SAWS · BELT SANDERS · GRINDERS · SURFACERS · DRILLS · DISC SANDERS · FLOOR SANDERS

PORTABLE ELECTRIC TOOLS

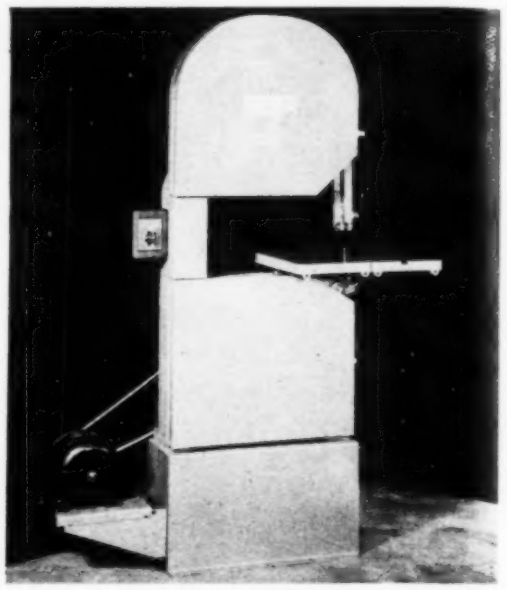
SEE YOUR DISTRIBUTOR ...he will gladly demonstrate how SKILSAW TOOLS will save you money

SKILSAW, INC.

5045 ELSTON AVENUE, CHICAGO

• 36 East 22nd St., New York • 52 Brookline Ave., Boston • 182 Main St., Buffalo • 15 S. 21st St., Philadelphia • 2902 Euclid Ave., Cleveland • 2124 Main St., Dallas • 918 Union Street, New Orleans • 29 North Ave., N. W., Atlanta • 2645 Santa Fe Avenue, Los Angeles • 2065 Webster Street, Oakland • Canadian Branch: 85 Deloraine Avenue, Toronto.

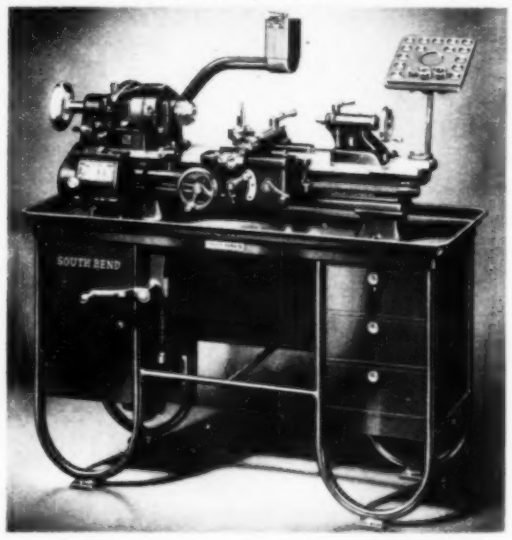
20-IN. BAND SAW is designed to serve either as stationary shop tool or as portable unit on construction jobs. Completely guarded to insure safety of operator. Furnished with electric motor, gasoline engine or without power with pulley for belt drive.



Useful for cutting form lumber, especially on curved forms. Sealed ball-bearings carry upper and lower wheels. Tension device, set by handwheel, takes up sudden shocks or strains. Table can be tilted and locked in position. Overall floor space occupied (without power drive) 20x26 in.; length of saw blade, 10 ft. 9 in.; maximum height under guide when raised, 8¼ in.; maximum width of saw blade, 1 in.; speed, 600 r.p.m.; power required, ½ to 2 hp.; net weight, without power, 375 lb. — **C. H. & E. Manufacturing Co., 3849 North Palmer St., Milwaukee, Wis.**

★ ★ ★

10-IN. TOOL ROOM BENCH LATHE with 1-in. maximum collet capacity, is said to be a highly efficient tool for precision operations on small work. Mounted on welded steel bench, lathe is claimed to have rigidity and stability of floor-type lathe, combined with speed, convenience and space-saving advantages of bench lathe. To simplify use of lathe and to prevent operator fatigue, hand wheels have been made large in diameter, graduations clear cut and easy to read and controls conveniently arranged. Smooth, vibration-free operation at high spindle



speeds achieved in this lathe by use of direct belt drive to carefully balanced cone and spindle assembly. Headstock has 1⅜-in. capacity and can be equipped either with hand-lever or hand-wheel-type draw-in collet chuck taking collets up to 1-in. capacity. Twelve spindle speeds ranging from 50 to 1,357 r.p.m. are provided by standard motor drive equipment. Full quick change gear mechanism provides power longitudinal carriage feeds .0015 to .0836 in., power cross feeds .0006 to .0313 in. and series of 48 right- and left-hand screw threads from 4 to 224 per inch. Made in 3-, 3½-, 4- and 4½-ft. bed lengths, providing center distances of 16⅜, 21⅜, 27⅜ and 34⅜ in., respectively. Comes mounted on tubular steel bench, as illustrated.—**South Bend Lathe Works, 425 E. Madison St., South Bend, Ind.**

Speaking of "Small" Tools . . .

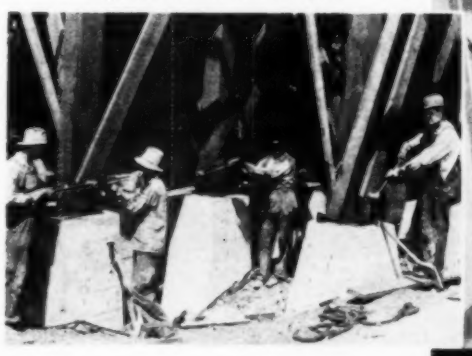
the BIG *name is*

LOWELL

Reversible Ratchet Wrenches

● Put a Lowell Bridge Builders Wrench on the shank or shaft and it stays there until the work is completed. Time saved by not refitting.

● Around construction work we find the Lowell Steel Socket Bridge Wrenches classified as the dependable tool for the job.



● Up in the air they must have dependable tools and that is why this man is using a "LOWELL."

● Where brute strength is needed and small space provided "LOWELLS" prove their worth.

● In the tunnels like under the Hudson River bolting heavy parts calls for husky dependable wrenches. That is why "LOWELLS" were chosen.

Briefly — if you want the Reversible Ratchet Wrenches that can "take it"—and do the work they're made for—and protect the men who use them—the word is "LOWELL". There's a Lowell Wrench in every size from 6" to 6 feet. Send for descriptive Catalog R.

● Much time is saved by using Lowell Reversible Ratchet Wrenches where nuts are continually tightened and loosened like on come along clamps.

1869 LOWELL 1940

WRENCH COMPANY

WORCESTER, MASS.

PONY

Solid Shank

FEATHERWEIGHT

Shovels

•

PERFECT BALANCE

A new redesigned socket gives to the PONY Solid Shank Shovel the perfect balance which no other solid shank shovel has.

Equipped with

SHOCK BAND

The famous ABW Shock Band gives to the shovel greater handle strength. This is a patented feature of PONY Solid Shank Shovels.

Ask Your Jobber

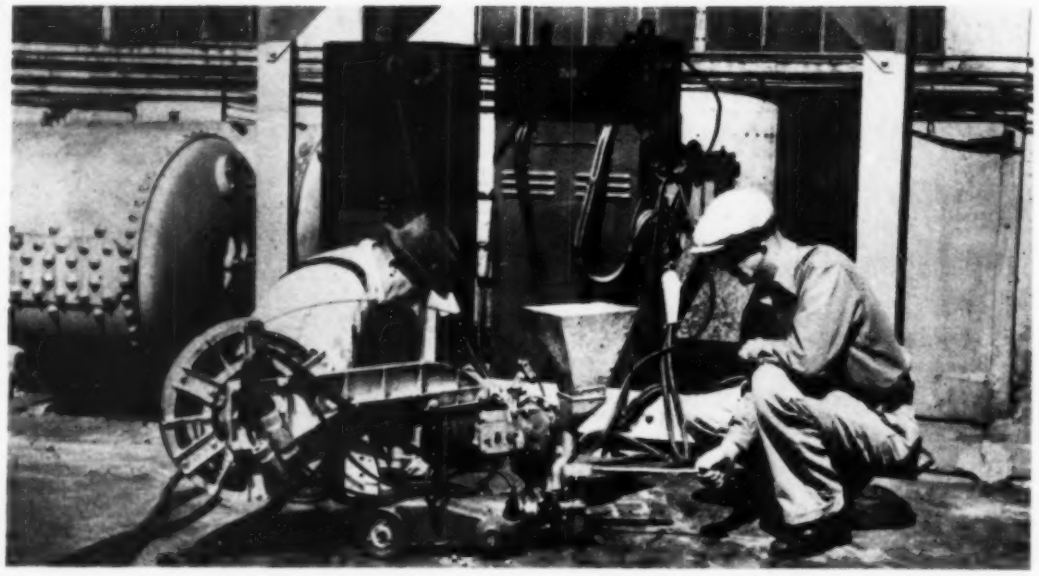
AMES Since 1774

AMES BALDWIN WYOMING CO.

Parkersburg, W. Va. North Easton, Mass.

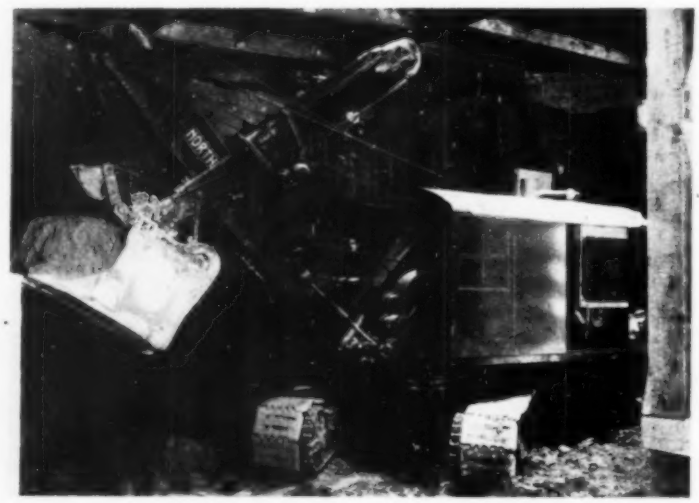
ABW PRODUCTS

SHOVELS FORKS
SPADES HOES
SCOOPS RAKES
POST HOLE DIGGERS
AGRICULTURAL HANDLES



FOR HIGH-SPEED HEAVY-DUTY WELDING as performed by Unimelt process, developed by The Linde Air Products Co., a.c. 1,000 amp. welders with wide current ranges which may be operated singly or in parallel are said to be efficient and economical, as illustrated by 1,000-amp. unit (mounted with its control in portable cradle) supplying current to automatic welding head set in position to make welds in 1-in. plate in foreground. On some installations as many as four 1,000-amp. welders are used in parallel, providing current range from 200 to 4,800 amp. Current changes are made under load without shifting electrical connections. Method is claimed to produce high quality welds at increased speed, thus expediting welded fabrication of ships, cars, tanks and pressure vessels.—**Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.**

★ ★ ★



TUNNEL SHOVEL 1½-cu.yd. capacity, for tunnel and basement excavation, has been designed to provide greatest cutting height, digging and dumping radius practicable with low clearance. Includes all standard Northwest features, such as welded boom, "feather touch" control, dual crowd and uniform pressure swing clutches, and in addition, may be converted for dragline or regular shovel duty, using proper booms and bucket equipment. —**Northwest Engineering Co., 1728 Stegar Ave., Chicago, Ill.**

★ ★ ★

BELT-CONVEYOR LOADING ATTACHMENT for Model 99 power grader has been developed for removing surplus material from shoulders along paved highways and loading it into trucks for disposal. Will handle clay, mud, sod, grass and any other material which accumulates around ditches and shoulders, leaving surfaces smooth and undisturbed and with correct slope. Collecting bowl at bottom gathers dirt as power grader moves forward, and by means of ribbon screws and cutters, feeds dirt on to moving belt. Regular grader blade-bit at front of collecting bowl has combined cutting and leveling action. Power to operate loader is transmitted from engine by special clutch. Control of belt movement said to be instantaneous and constant. Loader claimed to pick up and load as much as 100 cu.yd. per hour.—**The Austin-Western Road Machinery Co., Aurora, Ill.**

IS MAKING ENGINEERING HISTORY

TIMBERS joined by TECO Connectors will do more work than timbers joined the old way—with many bolts, plates and angles . . . *Frequently a single 2½" TECO split ring connector will carry more load than six one-half inch bolts.*

Timber construction, fundamentally our lowest cost means of doing heavy work, can now be employed for a wide variety of new applications.

The connector system has revised traditional formulas for designing in timber . . . changed it from a carpentry to an enginering material and stimulated the establishment of widespreqd new capacity for shop fabrication.

TECO Connectors spread the load on a timber joint over practically the entire cross section of the wood. In bolted joints this stress is localized around the bolt.

WOULD YOU LIKE TO KNOW HOW

nearly 30,000 new structures—hangars, bridges, trestles, dry docks, barracks, trusses, towers and oil derricks—have saved money by employing low-cost TECO-equipped lumber construction?

HAVE YOU FULL, DETAILED INFORMATION ON THE TECO CONNECTOR SYSTEM? WRITE TODAY. USE THE COUPON BELOW.

Timber ENGINEERING COMPANY INC.

Dept. M-11 1337 Connecticut Avenue

WASHINGTON, D. C.

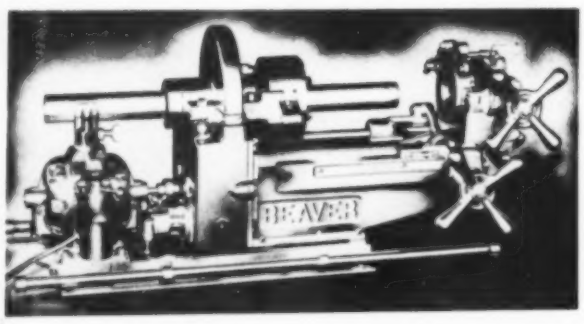
TIMBER ENGINEERING COMPANY, Inc., Dept. M-11
1337 Connecticut Avenue, Washington, D. C.

Please send us full technical information on the new design opportunities in timber made possible through the development of the Teco Connector system.

Individual .....
Firm .....
Street .....
City ..... State .....

The A-B-C of Pipe and Bolt Machines

From $125 up! ***Immediate delivery!***



Beaver Model-A

A high-speed heavy-duty deluxe pipe and bolt machine, complete in every detail and admitted leader in its field. Will cut, thread and ream ⅛ to 2-inch pipe and, with drive shaft and geared tools, will cut and thread 2½ to 12-inch pipe. Threads bolts ¼ to 2-inch; cuts off bolts (wheel cutter) up to ⅞-inch. New high speed model outperforms all competition. Right-handed — like a lathe. More than 50% greater open working space. All controls in front. Wheel or knife cutoff. Standard geared chuck with automatic safety wrench ejector. Safety shear pin. Ring-type opening adjustable dieheads—no hinge. Die segments adjust simultaneously as a unit. Choice 110 or 220 volt universal reversible motor. Automatic gear-driven oil pump. Easily portable when mounted on stand with 17-inch wheels. Weight approximately 415 lbs.

$309.50 up

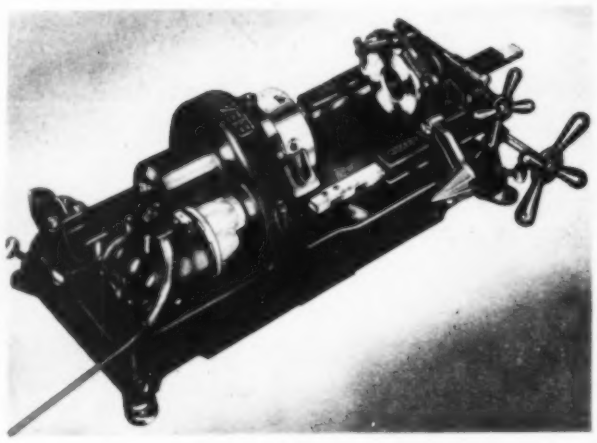
Write for Bulletin A & What Users Say

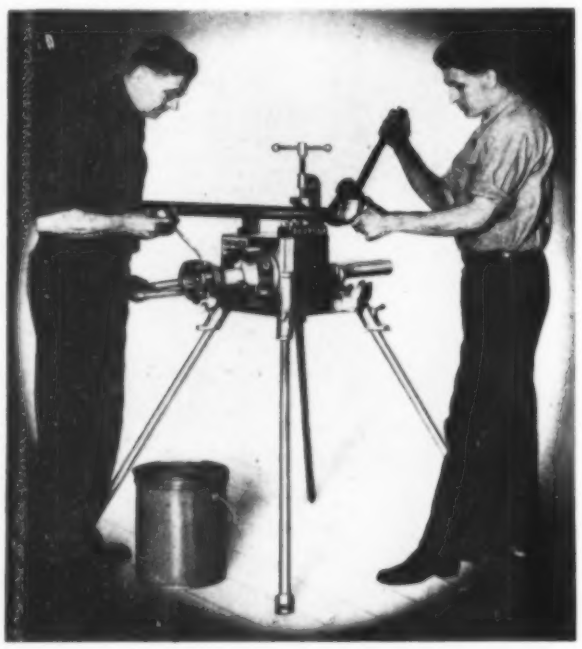
Beaver Model-B

Beaver Model-B is a highly efficient ⅛ to 2" low-priced portable utility machine embodying many advanced features heretofore available only on higher priced machines. Complete range ⅛ to 8-inch pipe; ¼ to 1½-inch bolts. Rack-and-pinion feed; 60% more power; one-piece cast steel-iron base and cap—no flimsy sheet metal housing; sockets for pipe legs to form inexpensive but sturdy stand; all-steel geared universal ⅛ to 2-inch chuck — with safety automatic chuck wrench ejector; hinged full-range reamer; sliding wheel or knife cutoff; ring-type opening adjustable dieheads — no hinge. Automatic gear-driven oil pump or one-gallon oil reservoir optional. Adequate motor ventilation. Choice of 110 or 220 volt universal reversible motor. Easily portable when mounted on stand with 17-inch wheels. Used by such firms as Fisher Body; Du Pont; Bethlehem Steel; J. & L. Steel; etc. Weight approximately 280 lbs.

$217.50 up

Write for Bulletin B & What Users Say





Beaver Model-C

Convert your present hand pipe tools into electric tools to cut, thread and ream ⅛ to 2-inch pipe. With drive shaft and geared tools 2½ to 8-inch pipe may be cut and threaded. Bolts up to 1½-inch size. Has ample power to allow for dull dies and low line voltage. Choice of 110 or 220 volt universal reversible motor. Now equipped with automatic chuck wrench ejector and safety latch — to protect machine and workman. Equipped with legs, vise and bender, as illustrated, the Beaver Model-C becomes a complete portable electric pipe shop. Model C-1 is furnished without vise; Model C-2 is supplied with vise. Set of Legs and Fittings, $5.50. Bender, $1.50.

$125.00 up

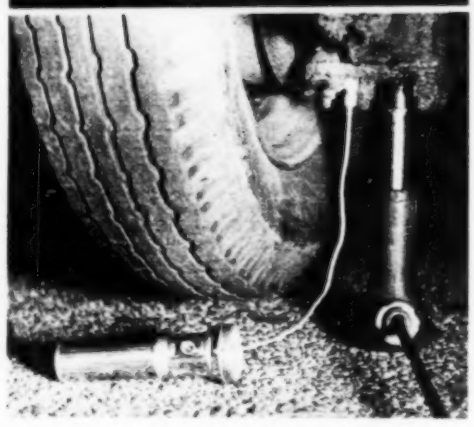
Write for Bulletin C & What Users Say

Write for complete Catalog of Beaver Pipe Tools (Hand and Power) — Cutters — Threaders — Reamers — Beveling and Grooving Tools, Pipe and Bolt Machines.

BEAVER PIPE TOOLS

1100 DUFF AVE. ***Quality Tools — Since 1900*** **WARREN, OHIO**

FLASHLIGHT BULB EXTENSION for use when light is necessary in hard-to-get-at places, such as crevices, down in drilled holes and for inspecting restricted openings between walls is made of special wire incased in aluminum alloy tubing.



Available in lengths from 6 to 36 in. and may be extended in multiples. Plug end screws into any flashlight and bulb is screwed into opposite socket. To inspect complicated machinery or earth formations, operator shoves device to desired location. May be bent at will or shaped as hook and will stand in any position. — **Sierra Aircraft Co., Sierra Madre, Calif.**

★ ★ ★

COTTON TAMPING PLUGS, manufactured for use in underground drill holes, are said to provide soft, spongy airtight seal which confines disrupting gases momentarily, causing complete detonation of powder. Claimed to reduce powder costs, to lessen gas fumes and to prevent powder from being blown out of hole without exploding. Other advantages listed: (1) Fireproof and non-inflammable; (2) economical; (3) safer—cannot damage fuse or wires; (4) will not freeze or dry out; (5) light, convenient and easy to use; (6) non-clogging—will not float or migrate in drainage water, clog pumps or blind battery or ball mill screens. Calcot tamping plug weighs ⅓ oz., and 52 are packed in tough, Kraft paper bag for convenient handling by miner. —**California Cotton Mills Co., Oakland, Calif.**

P&H-MODEL 255-A (3/4 YARD)

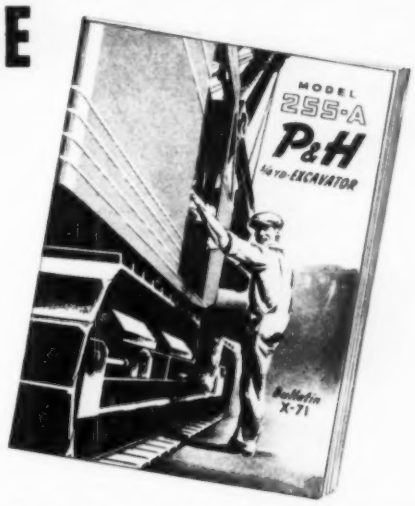
WE MAKE THIS PROMISE ABOUT THIS MACHINE—

— that you never ran an excavator of any size, at any price, with such smooth, fast, responsive control. It's a major improvement in excavator performance that cuts time — cuts cost — gives you more dependable operation from every standpoint.

Positive Hydraulic Control

You'll like this new P&H control as well as the hydraulic brakes on your car. It's the same low-pressure hydraulic system universally adopted by the automotive industry — proved over many years. On every move in crowd, hoist, swing, and travel, you get that same velvety "feel" you're used to in your car . . . and it's faster than you'll want to run it.

From husky, rolled steel construction and tractor type crawlers to its electric dipper trip, this machine is years ahead of the field. See it at work, run it, and judge for yourself!



ASK FOR YOUR COPY

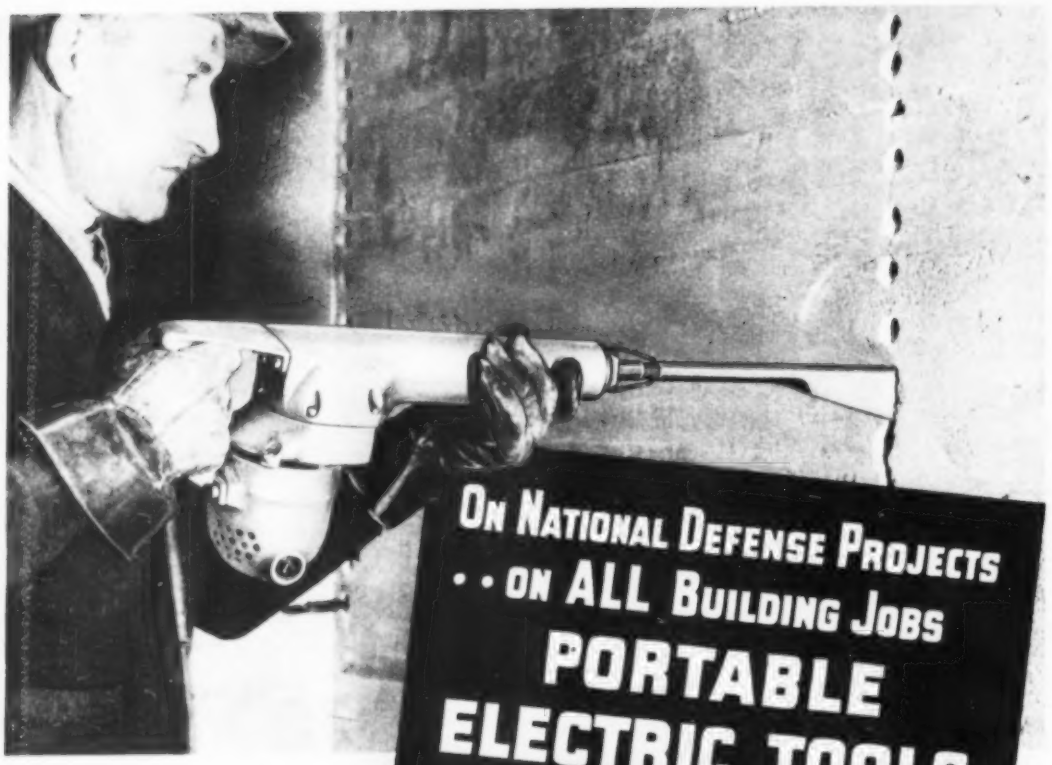
P&H Model 255 (¾ yd.) excavator fully described in this new bulletin, just off the press. Ask us to send your copy of Bulletin X-71.

P&H excavators are built in all sizes from ⅜ to 5 cu yds. capacity; gasoline, Diesel and electric power. Literature is available on all models.

General Offices: 4494 West National Avenue, Milwaukee, Wisconsin

HARNISCHFEGER CORPORATION

EXCAVATORS • ELECTRIC CRANES • ARC WELDERS P&H HOISTS • WELDING ELECTRODES • MOTORS

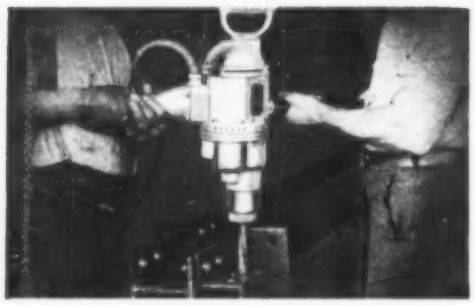


Cutting opening thru concrete wall with Black & Decker Portable Electric Hammer. These husky tools also deliver sledge-hammer blows for channeling in concrete, brick or stone, vibrate concrete for a denser mix—drive star drills, bull points, wood chisels or other heavy construction tool bits. There are 4 B & D Electric Hammer models.

ON NATIONAL DEFENSE PROJECTS ··ON ALL BUILDING JOBS

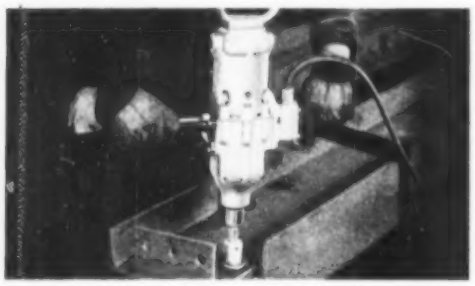
PORTABLE ELECTRIC TOOLS

Clip time off schedules!



Heavy Duty B & D Electric Drill reaming steel beam — one of the many applications of these powerful tools in construction work. Models for every job.

YOU can't beat the wide application and low-cost performance of Black & Decker Portable Electric Tools. They speed up work on National Defense projects – just as they deliver efficient service on regular contracting and building jobs. Plug in any electric socket or portable generator, and you're all set to hammer, saw, drill, channel, run nuts, shape wood beams – perform any operation hand tools will do in a fraction of the usual time. Check over the electric tools applications shown here – then phone your jobber to demonstrate the B & D Tools you need – or wire The Black & Decker Mfg. Co., 759 Penna. Ave., Towson, Md.



Using Electric Nut Runner to tighten nuts on structural steel — an operation that speeds up framework erection. B & D also makes a complete line of Sanders for every sanding and surfacing job on wood, metal or stone.

Black & Decker #75 Saw grooving marble. These fast electric Saws also save time in cutting studs, rafters, joists, flooring, roof trusses and other structural lumber. Your choice of 4 B & D Saw models for every job from trim work to heavy duty sawing.

LEADING DISTRIBUTORS EVERYWHERE SELL

Black & Decker

B&D ELECTRIC TOOLS TOWSON, MD

PORTABLE ELECTRIC TOOLS

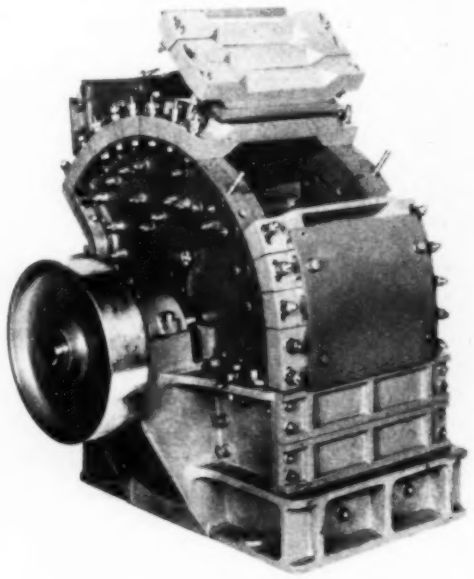
SAFETY GOGGLES are made in 50 and 45.8 mm. sizes and are said to provide complete comfort plus all-around protection. Equipped with pliable, snug-fitting leather masks, wire screen ventilators around eye cups and adjustable head bands. Super armorplate lenses for protection against impact or Calobar Super Armorplate lenses for glare and impact available, if desired.—**American Optical Co., Southbridge, Mass.**

★ ★ ★

NEW MOTOR OIL, known as Texaco 303, is for use in overcoming difficulties encountered in lubrication of automotive diesels and gasoline engines in heavy-duty service. Said to prevent clogging of filters, screens and oil lines; to stand up under higher speeds, temperatures and pressures in newer types of engines; to assure cleaner engines, higher efficiency over long periods of continuous operation with no harmful sludge nor carbon deposits. Corrosion of bearing metals prevented.—**The Texas Co., 135 E. 42nd St., New York City.**

★ ★ ★

IMPACT BREAKER, for breaking stone, gravel, flint, clinkers and slag, is slow speed fixed bar breaker which produces uniform cubical product of any size required by simple variation of speed. Breaker bars rigidly fixed to balanced rotor throw material with shattering force against V-shaped impact bars, splitting material along natural grain. Broken pieces



rebound from bars to be again thrown against successive bars as product travels downward. Broken material leaves machine through large opening in bottom of breaker. Discharge opening unrestricted by grid bars or screen. No grates to wear out. Size of broken material varies according to speed of rotor. Since no grinding action is employed, maintenance is said to be kept at minimum and product uniformly cube shaped.—**Iowa Manufacturing Co., Cedar Rapids, Iowa.**

GETTING DOWN TO FIGHTIN' WEIGHT

Getting the champ ready for the title bout is a matter of taking off useless pounds—never of adding them. And Diesel designers have been working steadily in this same direction for the past several years.

They've trimmed off excess weight . . . greatly reduced the number of pounds of engine per horsepower. Today's Diesels are more compact and efficient than ever before . . . with further improvements sure to come.

You can't make changes as drastic as these without altering the lubrication requirements. These smaller engines often have no increase in oil-reservoir capacity, yet they run at higher speeds and greater pressures . . . obviously a difficult problem for lubrication men.

Through first-hand contact with Diesels-on-the-job, Shell men have been able to keep the old-line Diesels running smoothly . . . have kept Shell lubricants steadily abreast of these newer, faster, higher-output engines.

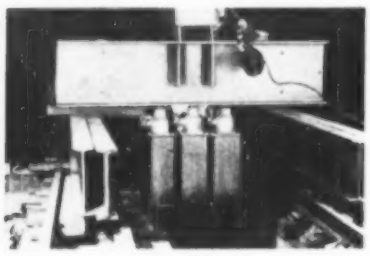
Shell men can help you harness your Diesel's power to effect the utmost economy. Call in your Shell representative . . . today.

SHELL

SHELL INDUSTRIAL LUBRICANTS

DUFF-NORTON JACKS move Block-long Building

ALMOST 100 Duff-Norton Jacks were used by Eichleay Engineering Corporation in raising and moving the 10,000 ton Central Square Garage of Youngstown, Ohio.

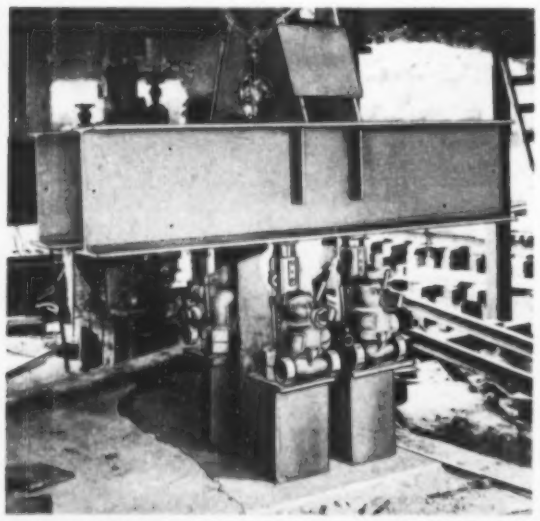


This modern 4-story steel frame building, the longest ever moved by this world-famous concern, was jacked up to clear old footings, moved back 27 feet from the old street line and lowered to the new footings.

In raising the building, jacks were placed under steel brackets welded to the 66 columns. As the Duff-Norton Jacks brought each row of columns to its full ½ inch raised position, rollers were wedged into place. This process was reversed in lowering the building onto its new footings.

The Eichleay Engineering Corporation is one of many progressive companies who rely on Duff-Norton Jacks because they have found them to be economical and dependable.

In order that you may be thoroughly familiar with the Duff-Norton line (which includes 300 standard types and sizes of jacks) we will gladly send you Catalog 113 which shows items used in construction work—Duff-Norton ratchet types, screw jacks, rotary air motor power jacks, bell bottom types, trench braces, push-and-pull jacks, etc.



The DUFF-NORTON MANUFACTURING CO.
PITTSBURGH, PA.
CANADIAN PLANT COATICOOK, QUEBEC
"The House that Jacks Built"

REVERSIBLE WRENCH. "power-vane" type, employs slow speed rotary motor, simple in design and claimed to be efficient in operation and economical in maintenance. Advantages listed by maker: (1) No gears; (2) springless driving unit;

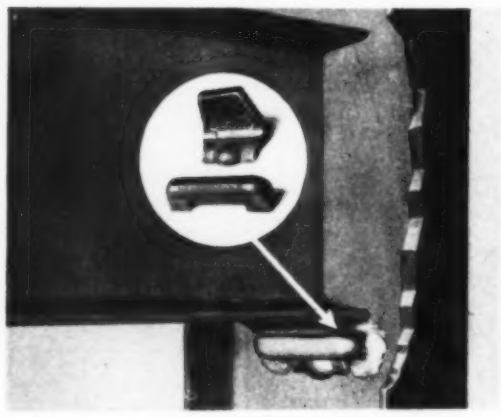
(3) short overall length; (4) tapered nose end; (5) ease of handling. Capacity, ⅜-in. bolts. Overall length, 6½ in. Spindle offset, 1⅜ in. Shank, ⅜ in. square; weight, 4¼ lb. Standard equipment, hexagon socket for nuts ⅜ in. across flats; 8-ft. 5/16-in. air hose and fittings.—**Chicago Pneumatic Tool Co., 6 E. 44th St., New York City.**

★ ★ ★

TWO-PIECE CAST STEEL TIP for tamping rollers of sheepsfoot type are said to assure savings in metal, cost and time. Bases of "Tamprite" tips are made of nickel steel claimed to have excellent welding qualities and great strength. Tips are made of chrome molybdenum steel that resists abrasion. Long tapered shank on base provides ample surface contact with socket of tip. Flat register in socket engages with flat area on shank and prevents tip from turning. After bases are welded on to tamper drum, subsequent cutting and welding are entirely eliminated. When replacements are needed, worn tips are driven off and new ones driven on. Renewals may be made in field and on job without expensive equipment or lost time.—**Los Angeles Steel Casting Co., Los Angeles, Calif.**

★ ★ ★

WELDED CONNECTION used in erection of welded steel construction consists of erection seat and clip. Illustration shows two steel members securely held in exact position by Saxe connections and ready for permanent welding. Inset shows



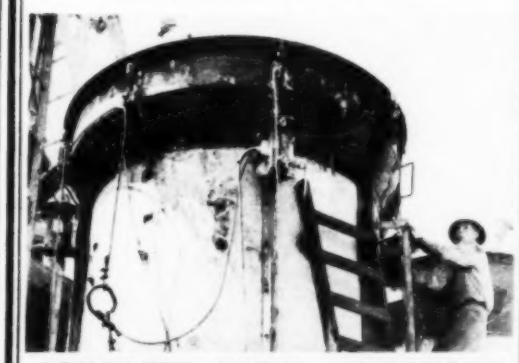
SYNTRON
REG. TRADE MARK

ELECTRIC TOOLS
Pay Big Dividends in Labor Saved

ELECTRIC HAMMERS
For Drilling · Cutting · Surfacing · Etc.
6 Sizes · From $80.00 up to $225.00

ELECTRIC SAWS
5 Sizes · Cuts of from 2" up to 4¾"
From $85.00 up to $225.00

CONCRETE VIBRATORS
Internal Type · Both Gas and Electric
From $235.00 up to $415.00



CONCRETE FORM VIBRATORS
For Wall Forms · Pipe · Screeds · Etc.
From $185.00 up to $245.00

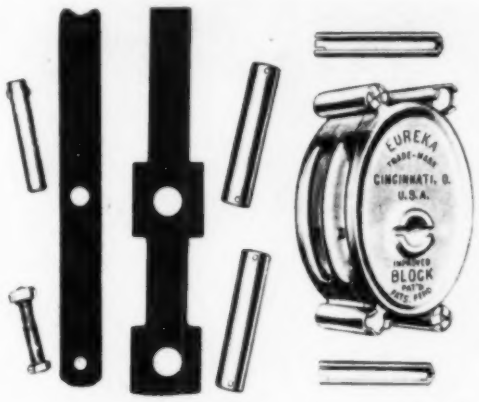
Phone our nearest big city office or wire or write

SYNTRON CO.
500 LEXINGTON AVE. HOMER CITY, PA.

clip and seat as they are delivered to steel fabricator for welding in proper position to fabricated steel parts. Hook-and-eye principle not only securely locks steel members in position but also its self-aligning action eliminates later plumbing costs. No specially trained labor or unusual equipment are needed in using these connections, nor do they cause any delay in performance of other structural operations.—**J. H. Williams & Co., 400 Vulcan St., Buffalo, N. Y.**

★ ★ ★

IMPROVED TACKLE BLOCKS for use of contractors, dredge and derrick operators, bridge and structural steel workers, quarries, mines, railroads, public utilities, highway departments and piledrivers, designed to assure greater safety, increased lifting capacity and efficiency and lower maintenance



OLD AND NEW STYLE STRAPS (left) showing increase in sizes of sheave and becket pins made possible by improved design. Demountable shell **(right)** of aluminum alloy for manila and of malleable iron and cast steel for manila and wire rope.

cost, have (1) safety straps widened at pinholes to permit use of extra large diameter sheave and becket pins. Increases capacity and safety. Greater oil cushion surface between bearing and pin reduces friction and replacements. (2) demountable shells of aluminum alloy for manila rope and of malleable iron and cast steel for manila and wire rope

MANILA ROPE BLOCK (left) capacity up to 30 tons, can be taken apart readily for inspection or replacement of parts. Wire rope blocks of malleable iron lift up to 50 tons, sheave diameters ranging from 16 to 24 in.

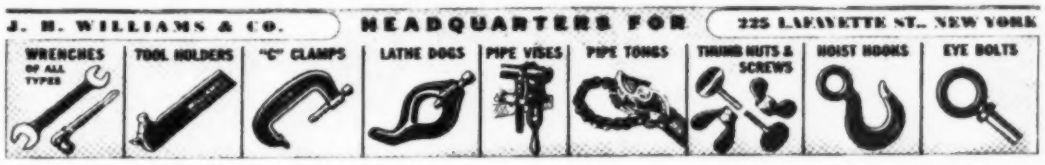
result in elimination of rivets, in use of fewer parts and in easy dismantling for necessary inspection or replacement when worn. Removable heavy steel zipper sleeves grip shell lugs and members securely. Greasing element in special aluminum alloy smooths and lubricates surface of rope and is said to preserve it and prolong its life. Manila rope blocks, capacities up to 30 tons, sheath diameters, 1¾ to 9½ in. Wire rope blocks, lift up to 5 tons, sheave diameters, 16 to 24 in. Cargo hoisting and handling blocks, sheaves 8 to 20-in. diameter. For special requirements shells can be supplied in cast steel, malleable iron, brass, bronze, rubber, Bakelite, fiber, and glass,—**Federal Alloy Block Co., 448 E. Pearl St., Cincinnati, Ohio.**

• **Industrial tool buyers not only need the better-value wrenches which Williams' line provides, but they need this informative booklet which will help any wrench user to make an intelligent and economical selection to fit specific wrench needs.**

Williams manufacture the most complete line of wrenches in the U. S. A., including both carbon and alloy steel types. The above booklet is not a catalog, but a comprehensive hand-book crammed with useful information and profusely illustrated throughout its 28 pages. A copy will be mailed to you without cost or obligation. Write for it today.

Williams' Wrenches are sold by industrial distributors everywhere.

J. H. WILLIAMS & CO. HEADQUARTERS FOR 225 LAFAYETTE ST., NEW YORK



"THIS BUCKET'S GOT WHAT IT TAKES"

• Tearing out this old Baldwin Locomotive Works foundation at Philadelphia was about as tough a test as a bucket ever gets. Wm. Geppert, Inc., owners of the bucket, report that the ½-Yard Williams Multiple Rope did an extraordinary job in digging into and removing the massive stone and heavy chunks of concrete.

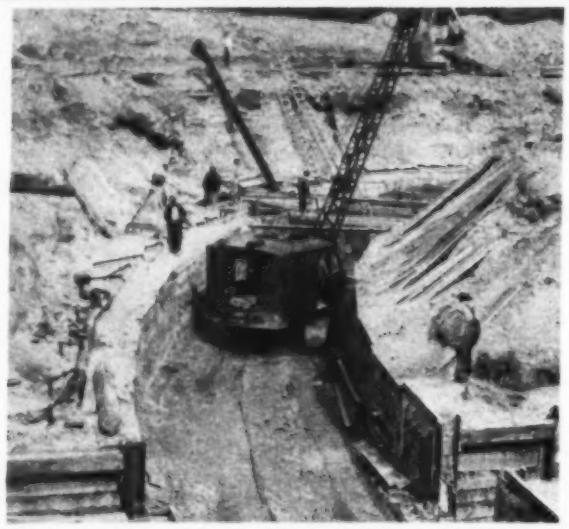
Powerful in biting and gripping, fast in action, and ruggedly built with welded construction at vital points, Williams Buckets are without a superior for hard service.

THE WELLMAN ENGINEERING CO.
7017 Central Ave. · Cleveland, Ohio

FREE *Bulletins describing all types of Williams Buckets sent* **FREE** *on request.*

WILLIAMS *Buckets*
***built by* WELLMAN**

SINCE 1935
5
MORETRENCH WELLPOINT SYSTEMS
for
Charles H. Tompkins Co.
Washington, D. C.



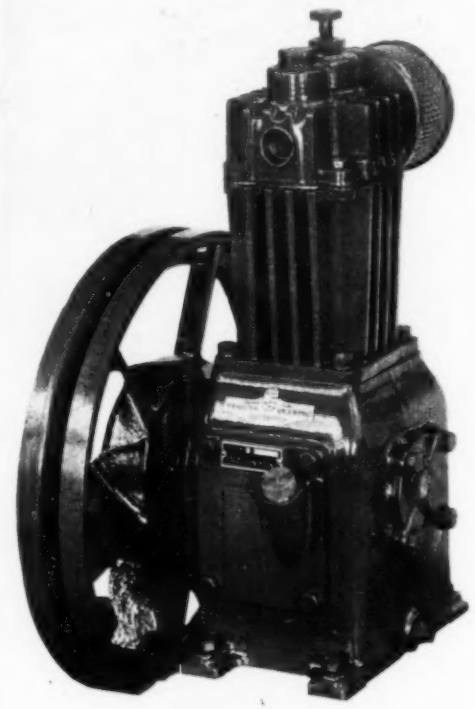
Digging in the Dry for One of the World's Largest Gas Holders, Chillum, Md.

• SEWAGE TREATMENT PLANT . . . BLUE PLAINS, D. C. • PRINTING WAREHOUSE . . . WASHINGTON, D. C.
• MUNICIPAL CENTER BLDG. . . . WASHINGTON, D. C.
• SEWAGE TREATMENT PLANT . . . HYATTSVILLE, MD. • GAS HOLDER . . . CHILLUM, MD.

That's a record of satisfaction that should make you think twice before buying or renting a wellpoint system for your work. • We have the equipment, the personnel, and the experience to *guarantee dry results on every Moretrench job.* Let us show you!

MORETRENCH CORPORATION
Main Office: **90 West Street, New York** ***Plant:*** **Rockaway, New Jersey**
Branch Warehouses: **Joliet, Illinois and New Orleans, Louisiana**

COMPRESSOR UNITS IN SMALLER SIZES for use in industrial, garage and diesel starting service are air-cooled, single and two-stage, and range in capacity from 2.8 to 45.7 c.f.m., ½ to 10-hp., with operating pressures (continuous) 100 to 200 lb. and intermittent, 150 to 500 lb. Smallest unit is 10⅛x14x18



in. high; largest is 20⅜x19½x25⅞ in. high. Features: Cushioned air valves, balanced crankshaft, taper roller main bearings, Lynite connecting rods, semi-steel pistons, positive lubrication, copper intercooler, chrome nickel cylinders and dust-proof crankcase. Automatic starting can be furnished. Units available bare, base or tank mounted, for V-belt drive from motor or air-cooled gasoline engine. Units for diesel starting may be had with combination motor and gasoline drive, so arranged that belt can be shifted readily to gasoline engine in case of current failure.—**Sullivan Machinery Co., Michigan City, Ind.**

★ ★ ★

STAINLESS STEEL WASHBOWL said to eliminate traffic problems during clean-up time in plants, institutions and schools, is called Memco groupwash and is assembled in sections. Leakproof joints have stainless steel heads and molded rubber gaskets. Individual sections may be replaced in case of damage. Base is made of 12-gage steel

with crackled baked enamel finish and has two removable panels for installation of plumbing connections. Accommodates 10 persons and occupies 16 sq.ft. of floor space. Exclusive feature: "Monitor" spray head which mixes hot and cold water to any temperature at constant pressure and provides shutoff with one control. Height, 29 in. Said to be virtually self-cleaning since spray action of water constantly rinses "pitched" sides while groupwash is in use.—**Metalloid Engineering & Manufacturing Co., Cincinnati, Ohio.**

SPEED UP CONCRETE SAVE 3 WEEKS

USE HIGH EARLY POZZOLITH

HIGH EARLY POZZOLITH

used with normal portland cement gives you —

**GREATER DURABILITY,
GREATER STRENGTH,
—AND SPEED!**

Using this exclusive Master Builders' product you will get —

1. — 28 day strength in 7 days. You save three weeks.
2. — 7 day strength in 3 days, which means you can strip forms faster, save four or five days each pour, need fewer form-sets.
3. — more accurate timing on slab work, avoiding flash sets which make timing of finishing operations difficult.
4. — less volume change which means less shrinkage, and in mass concrete, less heat evolution thereby reducing tendency to crack.
5. — better concrete using normal portland cement at economical prices, with all the famous Pozzolith longtime money-saving values . . .

SPEED UP AND SAVE

High Early Pozzolith permits you to quicken the completion of your job. You get rapid hardening, without sacrificing quality.

REMEMBER — POZZOLITH

Master Builders' exclusive cement-dispersing, water-reducing agent, —

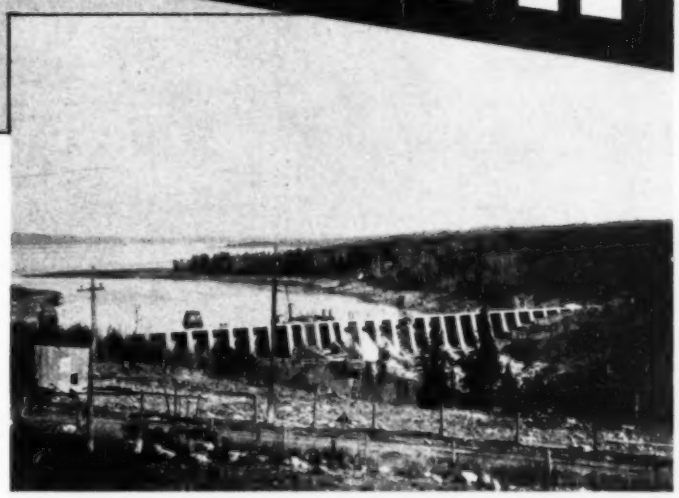
- — cuts mixing water 15% or more for given placeability.
- — increases slump 150% or more for given water-cement ratio.
- — increases compressive strength 20% or more.
- — increases durability, under freezing and thawing, 100 to 200%.
- — reduces bleeding, shrinkage, permeability.
- — cuts absorption 20%.
- — produces concrete of given strength and placeability with 15% less cement.

We will be glad to send to you complete information on High Early Pozzolith . . . Get this time-reducer working for you on the job . . . saving both time and money and getting better concrete.

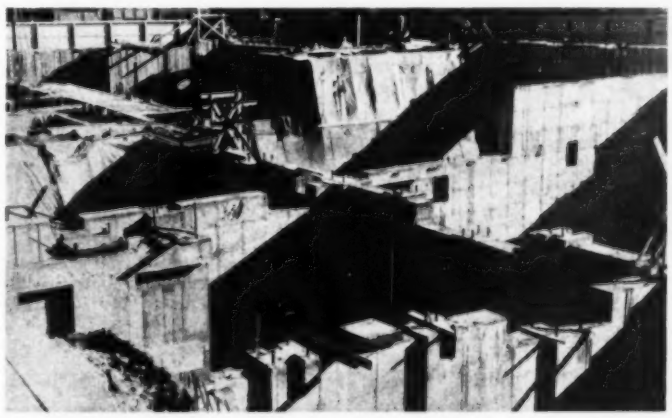
THE MASTER BUILDERS CO., LTD.

TORONTO, CANADA — MONTREAL, CANADA

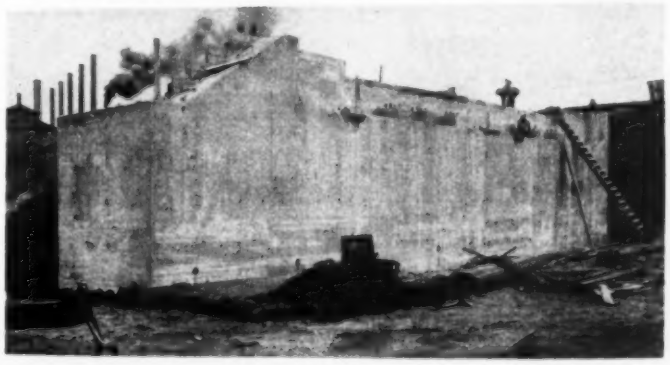
***In the U.S.A.*: The Master Builders Company, Cleveland, Ohio.**



POZZOLITH USED IN — Allard Dam, Disraeli, Quebec. Architect and Assistant Chief Engineer: O. Graham. Contractor: Creaghan & Archibald, Disraeli, Quebec.

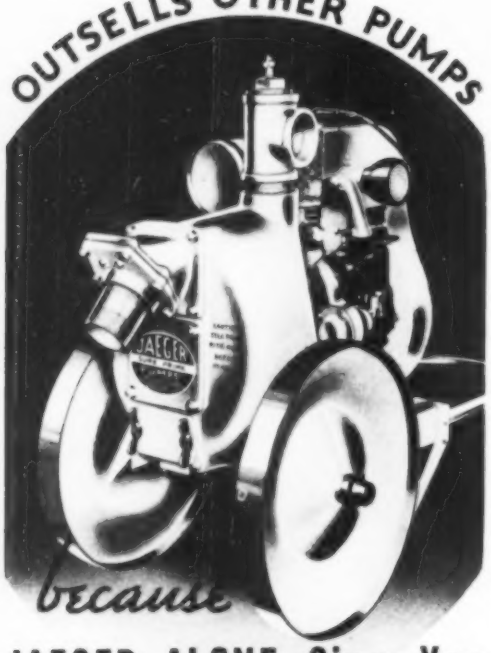


POZZOLITH USED IN — Bankers Life Home Building, Des Moines, Iowa. Architect: Tinsley, McBroom & Higgins, Des Moines, Iowa. Contractor: Arthur H. Neumann Bros. & Co., Inc., Des Moines, Iowa.



POZZOLITH USED IN — Concrete Abutment in Cuyahoga River Improvement Project, Cleveland Harbor Commission. PWA Project OH1756-F.

MASTER BUILDERS



JAEGER, ALONE, Gives You All These Pumping Features

JAEGER "PRIMING JET" — Up to 5 times faster priming and re-priming — often means difference between profit and loss on job. No adjustments — no need to "gun" engine.

POSITIVE RECIRCULATION CUT-OFF — It's controlled by flow, not pressure.

"FULL-RANGE" IMPELLER gives high efficiency under all conditions (built of steel in 4" to 8" sizes).

ACCESSIBLE SEAL — always outlasts the impeller.

PATENTED SELF-CLEANING SHELL — scours while pumping, won't clog, easily accessible.

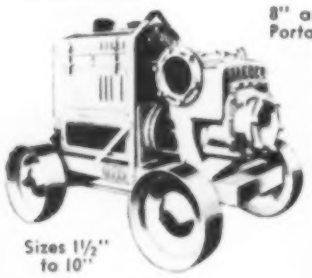
DEPENDABLE, LONG LIFE CONSTRUCTION — thousands of EXTRA hours of service.

EVERY PUMP INDIVIDUALLY TESTED for capacity and pressure before it leaves our factory.

Only $85 f.o.b. Factory — 3000 Gallon Bantam.

Send for Prices and New Catalog Describing Complete Line of World's Champion Sure Prime Pumps:

Compact 2", 3", 4" and 6" Sizes —Heavy Duty and Intermediate Types.



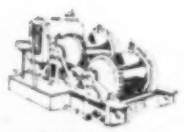
Sizes 1½" to 10"

8" and 10" Sizes, Most Portable Big Pumps on Market — Capacities to 220,000 G.P.H.

Convertible Jetting - Dewatering Pumps (Two Pumps in One). Vertical Caisson Pumps, Well Point Systems, Triplex Road Pumps.

MIXERS Tilting, Non-Tilt, 3½S to 56S

HOISTS 6 to 100 H.P.



THE JAEGER MACHINE CO.

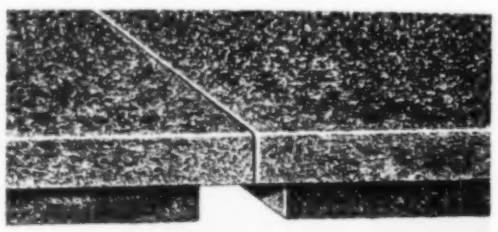
800 Dublin Ave., Columbus, Ohio

PORTABLE SAW TABLE that can be taken out on job, set up quickly and used to convert No. 85 Quicksaw to saw-table use for fast, correct ripping

mitering and beveling. Saw table of portable saw locks in place in center of other table top and all depth and angle adjustments may be made. Table is made of sturdy heavy-gage sheet metal, and has demountable legs, an adjustable ripping guide, and clamps to hold saw in place.—**The Van Dorn Electric Tool Co., Towson, Md.**

★ ★ ★

NEW TYPE ROOF INSULATION, called Celotex Vapor-Seal, designed to withstand moisture conditions, is made by fabricating insulation units with offset edges on lower sections so that when tops of two edges are butted together, channel is formed along under side of joint. These channels serve as expansion chambers, relieving accumulations of



vapor pressure built up by high humidities and temperatures and eliminating roof blisters and buckling caused by air expansion. Each unit is treated with special asphalt coating on all surfaces for protection against moisture pickup while in storage or during application. Asphalt vapor seal said also to provide stronger, more permanent and moisture-proof bond between roof deck, insulation and roof covering. Available in thicknesses of 1, 1½, 2 and 3 in.—**The Celotex Corporation, 919 N. Michigan Ave., Chicago, Ill.**

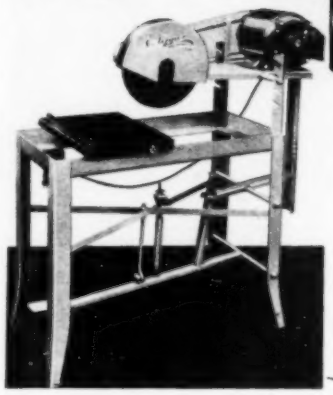
★ ★ ★

ELECTRICALLY-DRIVEN AGITATORS of 5-cu.yd. capacity and equipped with 25-hp. electric motor drive are being used to facilitate concreting operations on Delaware aqueduct project, by Seaboard Construction Corp. Central mixing plant is located near each shaft at ground level and feeds concrete to underground workers 350 ft. below, for tunnel lining operations. Concrete is passed down

chute, a 12-in. diameter pipe, and lands in hopper. Some concrete is left in hopper to cushion impact of new batches. Controllable gate permits discharge from hopper into agitators. Each unit is transported on specially made flat car, tractive power being furnished by battery-driven mine locomotive capable of hauling two cars. At point of discharge, sometimes as far as 1½ mi. from shaft, sources of current are tapped to operate agitators and condition concrete for use.—**Blaw-Knox Co., Blawnox, Pa.**

Chicago Subway

A UNIQUE USE FOR CLIPPERS



PERHAPS, BUT.....

Another Example of its Many Uses for Cutting All Masonry Materials

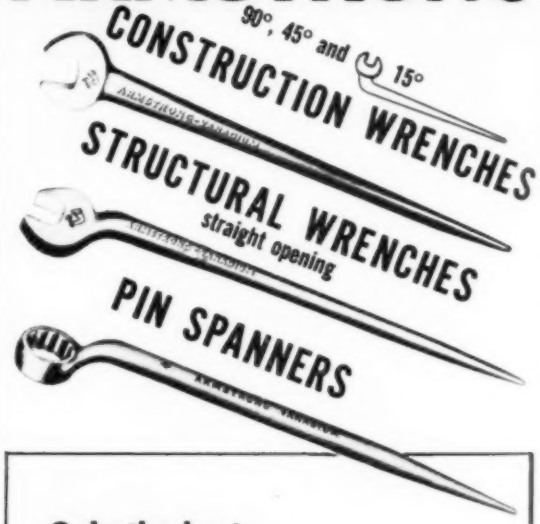
Adopted by the Walter H. Flood Company, Testing Engineers, the CLIPPER MASONRY SAW IS EFFICIENTLY cutting "cubes" from Concrete Cores preparatory to Crushing Tests . . . .

PROVEN BY ACTUAL USE
GUARANTEED BY OUR FREE TRIAL
CUTS ANY MASONRY MATERIAL

The Clipper MFG. COMPANY

ST. LOUIS, MISSOURI

ARMSTRONG



Only the best can be economical

In construction and structural wrenches only the best will do, for there's no controlling the stresses and strains one of these wrenches may be subjected to. That's why so many builders are standardizing on ARMSTRONG Wrenches. Drop Forged from special Carbon or Chrome Vanadium steels, they have deep and narrow jaws that take a secure grip on the nut and an extra long taper for ease in lining up bolt holes. Construction Wrenches with 15, 45 and 90° degree heads. Structural Wrenches (both open end and socket types) have off set heads to clear obstructions and keep head squarely on the nut. Milled openings from 7/16" to 2", Box Wrench from 1 1/16" to 2 9/16".

Write for Catalog.

Armstrong Bros. Tool Co.

"The Tool Holder People"

334 N. Francisco Ave., Chicago, U.S.A.

Eastern Warehouse & Sales:
199 Lafayette St., New York

Buy ARMSTRONG TOOLS from your Supply House

Above—LIMA Type 1201 Shovel owned by Peterson Coal Co., Beloit, Ohio. This machine is equipped with a 42′ boom, 32′ dipper handle and 2½ yard dipper.

Left—LIMA Type 1201 Dragline, owned by L. E. Harris, Dundee, Mississippi. This machine is equipped with a 90′ boom and a 3 yard bucket.

LIMA type 1201 Shovel or Dragline

You will like the LIMA Type 1201 combination shovel and dragline for its big output in heavy duty digging; its wide working ranges; its accurate, speedy operation and low up-keep cost. The standard shovel is equipped with a 30′ boom, 20′ dipper handle and a 3 yard dipper, however, where work requires a high lift machine, a 42′ boom, 32′ dipper handle and a 2½ yard dipper can be furnished. For dragline operation, booms may be had up to 100′. Take a tip from the many owners of LIMA stripping and loading machines, who are getting maximum results from their investment and make your next machine a LIMA.

LIMA

LIMA LOCOMOTIVE WORKS, Inc.
Shovel and Crane Division LIMA, OHIO, U. S. A.
NEWARK, N. J. NEW YORK, N. Y. DALLAS, TEXAS PORTLAND, ORE.
MEMPHIS, TENN. LOS ANGELES, CALIF. SAN FRANCISCO, CALIF.
SEATTLE, WASH. PHILADELPHIA, PA. SPOKANE, WASH.
MONTREAL, QUEBEC, CANADA VANCOUVER, B. C.

LIMAS ARE BUILT IN ¾ YARD CAPACITY and LARGER

Gasoline Driven Whiteman "Precision" Floor Finisher with Detachable Extension Handle

NOT WITH A

WHITEMAN "PRECISION" CEMENT FLOOR FINISHER!

The Whiteman Finisher offers you real insurance against having your floors get out of hand, when extra finishers are not available. For your men can cover twice the area with this swiftly moving machine, which will travel over 1,000 sq. ft. in as little as 15 minutes.

The Whiteman Precision Method gives a properly constructed floor which is immediately apparent. You get good uniform distribution of coarse aggregate particles through the entire depth of the finish and right up to the wearing surface. You can use a low water ratio, for the weight of the machine will compact your aggregate, bringing what little water you have to the top. You avoid any film of laitance or weak mortar at the surface when the Whiteman Precision Cement Floor Finisher is used. The finished concrete is dense and strong. No dusting or crazing is possible. "Precision" finished cement forms a dense, wear-resistant floor, free from maintenance cost and trouble, which will meet every traffic demand placed upon it.

"Most Satisfactory"

Mr. Wm. P. Neil — who is head of the Wm. P. Neil Company, Ltd., Los Angeles, Engineers and General Contractors — writes the following:

"We own and operate six of the Whiteman Manufacturing Company's floor finishing machines, and we have found them to be most satisfactory both as to cost of operation and quality of work.

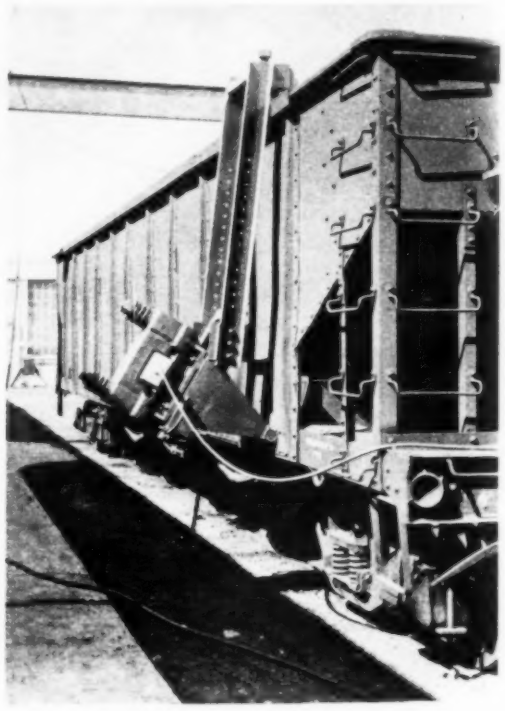
"These machines have proved such a success that we intend to use them in the future on all of our flat floors."

Write TODAY for the name of your nearest Whiteman dealer.

Electric Model Whiteman "Precision" Cement Floor Finisher

WHITEMAN MFG. CO.
3249 Casitas Avenue
Los Angeles, Calif.

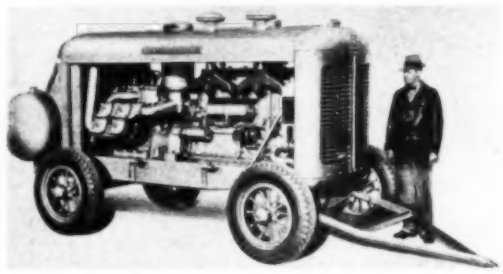
RAILROAD CAR VIBRATORS for speeding up emptying process are huge pulsating electro-magnets striking 3,600 times per minute and are attached in pairs by hooks, one on each side of hopper-bottomed car. Installations have shown, according to manufacturer that 2 men working with 2 vibrators can unload car of fine coal more quickly than 6 or 8



men sledging and poking. Vibrators are hooked to sides of car by crane or hoist. Units also may be used without car hook on big bunkers and storage bins to promote free flowing discharge of material. Each machine has separate electrical control panel containing thermionic valve for changing alternating to pulsating current, operating switches and a variable resistance for controlling vibrator's amplitude or power. Designed for operation on 220-v., single phase alternating current. Weight, with hook, 950 lb.—**Syntron Co., 500 N. Lexington Ave., Homer City, Pa.**

★ ★ ★

500-CU. FT. PORTABLE COMPRESSOR, largest of line of two-stage, air-cooled models, is available either with gasoline or oil-engine drive. Features (1) Automatic Fuel Saver changes engine speed according to use of air, claimed to eliminate much idling time and to save fuel; (2) new type Waukesha 6-cylinder gasoline engine with replaceable



cylinder liners and overhead valves, said not to require high grade motor gasoline; (3) new size improved oil engine fitted with replaceable cylinder liners; (4) engine and compressor built into unified plant, preventing disturbance of alignment during towing or when operating on rough and uneven ground; (5) two-stage, air-cooled feature said to save fuel, to eliminate carbonization and water joints and freezing hazards from compressor end; (6) channel valves, said to save power, to prevent valve impact and to stay tight; (7) cool air intake from outside of roof; (8) push-button electric starting; (9) magneto ignition; (10) all controls grouped on one panel; (11) simple, reliable clutch; (12) fuel tank, equipped with locking device, strainer, and water and sediment trap, may be filled from ground; (13) high capacity radiator; (14) thermostatic control; (15) quick-acting clevis bolts for drawbar; (16) wheels and axles said to be strong and heavy; (17) automotive-type chassis. Length, 13 ft. 6 in.; width, 6 ft. 11 in.; height, 6 ft. 8 in.; weight, 10,600 lb.—**Ingersoll-Rand Co., 11 Broadway, New York City.**

✓ Check

6 JOB-PROVED REASONS WHY THE A-W "99" POWER GRADER *gives you*

"AN EXTRA WORKING MONTH EACH YEAR"

✓ By providing new and unmatched efficiency in *traction* and *directional control*, the "99" moves more material, farther and faster . . . and will work efficiently in rough, wet or sandy ground where other motor graders cannot even go through with the blade empty.

✓ Ability to turn in a 55 ft. circle enables the "99" to work efficiently on narrow, winding roads, around curves, and in other "tight" spots where no conventional motor grader can work at all.

✓ The "99" can work on slopes as steep as 1½ or 2-to-1 if the material is hard and dry . . . and on slopes of soft or damp material as steep as 3½-to-1.

✓ The "99's" standard blade is 13 feet instead of 12 feet, which means it moves the material one-twelfth farther on every trip.

✓ Precision Side Shift and Stabilized Blade combine to make possible closer tolerances on fine grading with speed and unvarying precision. Both ends of the blade are held on the floor even when the "99" is working around sharp curves.

✓ The "99's" superior traction and directional control permit its use with an unprecedented number of attachments . . . mounted both ahead and behind the grader . . . for quicker, more economical handling of a wide variety of construction and maintenance jobs.

These six major "99" advantages, and many others, are made possible by the co-ordination of A-W All-Wheel Drive, All-Wheel Steer, Hydraulic Power Control, Precision Side Shift, and Stabilized Blade. The result of their combined efficiency is an economical ALL-SEASON power grader that gives you an "extra working month each year." Write for full details. Ask nearest A-W Distributor for proof-establishing demonstration. THE AUSTIN-WESTERN ROAD MACHINERY CO., Aurora, Illinois.

MOTOR GRADERS
LOADERS
BLADE GRADERS
ELEVATING GRADERS
HYDRAULIC SCRAPERS
CRUSHING AND SCREENING PLANTS
CABLE SCRAPERS

AUSTIN-WESTERN

ROLLERS
ROLL-A-PLANES
MOTOR SWEEPERS
BITUMINOUS DISTRIBUTORS
SHOVELS AND CRANES

LUFKIN

CHROME FACE STEEL TAPES

"WESTERN" FOR HEAVY DUTY

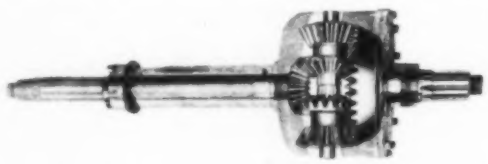
If you want an extra rugged, extra durable steel tape that's easy to read, get the Lufkin "Western" with the new Chrome Face line. The jet black markings stand out prominently against a satin chrome surface that won't rust, crack, chip, or peel and is easy to clean. The line is substantially heavier than engineers standard weight. See it at your dealers and write for our free catalog 12B.

LUFKIN

SAGINAW, MICHIGAN · New York City

TAPES · RULES · PRECISION TOOLS

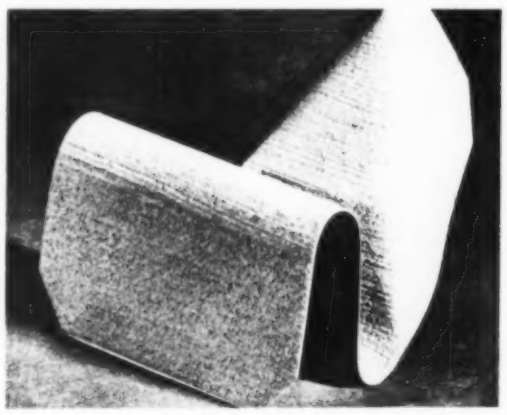
NEW POWER PROPORTIONING DIFFERENTIAL for use on six-wheel-drive trucks, distributes driving power to each axle in direct proportion to its normal loaded weight. Provides full differential action between driving axles of truck. In new differential side gears have unequal radii and differential pinion gears are arranged to meet unequal sized side gears. Ratio between pinion and side



gears operates as continuous lever in such manner that same force applied on shorter leverage of differential side gear connected to front axle reduces torque applied to that axle while same force applied to rear leverage of larger side gear connected to rear bogie increases torque to two driving axles of bogie. Gearing is arranged so that 4:1 ratio is obtained. Since balance is obtained by gearing, no movement between gears occurs except where differential action occurs as when rounding corners, driving over uneven ground and the like. Advantages claimed: (1) Increased drawbar pull with free differential action; (2) added hill climbing ability; (3) elimination of front wheel spin; (4) increased tire mileage; (5) additional all-around performance; (6) lower operating and maintenance costs.—**The Four Wheel Drive Auto Co., Clintonville, Wis.**

★ ★ ★

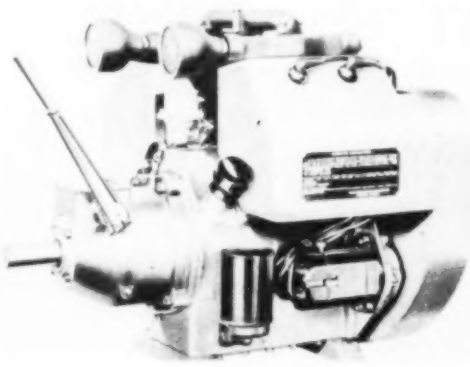
BUILDERS' PLASTIC is an oil-base Portland cement product combined with various fine aggregates so ratioed and processed that it produces a firm, tough yet flexible surface. Said to be applicable to all types of surfaces—brown mortar, plaster wall,



cement, concrete, brick, tile, glass, wood, wood veneer, plywood, fiberboard, steel, iron, aluminum, alloys, muslin, canvas, paint, and films. Layers required said to be thin and resistant for long wear. May be applied by brush, spray gun, or trowel. Claimed to be non-peeling, non-cracking, weather and saltair proof, resistant to heat and cold, fire retarding and washable.—**Rogear Co., 11 Water St., New York City.**

★ ★ ★

V-TYPE HEAVY-DUTY AIR-COOLED ENGINE. 4-cylinder, 4-cycle, designed for all classes of work within its power range, comprises engine with magneto with impulse coupling, carburetor, fly ball governor, fuel pump, oil filter, spark plugs and wires, and starting crank. Unit has 3x3¼-in. bore and stroke, develops 20 hp. at 2,200 r.p.m. and has displacement of 92 cu.in. Positive cooling is



Only DIXON *Gives You This Guarantee of* EXTRA *Strength and Wear!*

STEMS of ALL "BOSS" COUPLINGS NOW *CORRUGATED* . . . NEW *STEEL* CORRUGATED MALE STEMS—1/2", 3/4", 1" SIZES

Furnishing Male Hose Couplings with corrugated stems made of *steel*, is another *first* for DIXON. Furthermore, these new stronger, longer-wearing stems cost no more than the malleable iron stems formerly supplied. They are made with smooth, yet deep corrugations to insure a tight fit in the hose under clamp pressure, and ends are carefully rounded to prevent damage to hose tube. On sizes 1¼" and larger, stems are malleable iron, with new "COR-O-ZIG" Corrugations — one-half zig-zag pattern, one-half spiral pattern.

The Style MX-16 Male Coupling, illustrated above, is the companion for both the "BOSS" Washer Type and "GJ-BOSS" Ground Joint Couplings, described below. It is much more practical and economical than an iron pipe nipple, as it eliminates the need of over-size hose. Cadmium plated — rustproof. Sizes 1" and larger have 4-bolt "BOSS" Interlocking Offset Clamp; ⅞" and smaller have 2-bolt clamp.

"BOSS" FEMALE COUPLING
WASHER TYPE, STYLE W-16

Known everywhere for its efficiency, safety and economy, on steam, air or liquid lines, in high or low pressure service. Built to eliminate leaks, pressure losses and shutdowns, and to protect hose ends. Cadmium plated — rustproof. Sizes ¼" to 4", inclusive.

"GJ-BOSS" FEMALE COUPLING
GROUND JOINT TYPE, STYLE X-34

Same as "BOSS" Female Coupling described above, except for ground joint union of spud and stem. Copper insert in spud fits rounded head of steel stem, forming soft-to-hard metal seal that remains leak-proof, regardless of wear. No lost or wornout washers to replace. Sizes ½" to 4", inclusive.

Stocked by Leading Rubber Manufacturers and Jobbers

DIXON
VALVE & COUPLING CO.

MAIN OFFICE AND FACTORY, PHILADELPHIA

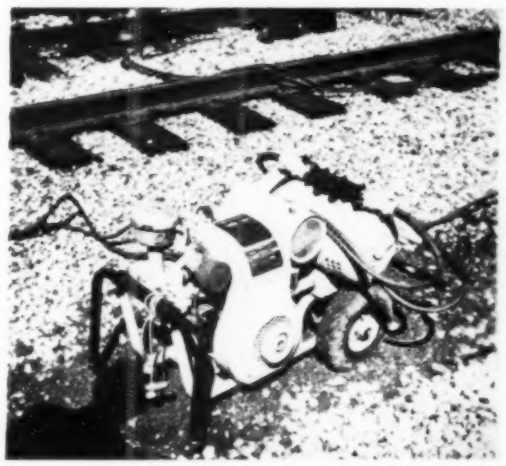
Branches: Chicago · Birmingham · Los Angeles · Houston

obtained from large fan cast in flywheel which forces strong blast of air across and around cylinders and heads. Self-contained oiling system which automatically lubricates all parts. Heavy, dynamically balanced crankshaft with long connecting rods and lighweight pistons said to insure smooth running engine at all speeds. Crankshaft mounted, front and rear, on Timken roller bearings. Mechanical flyball-type governor provides close regulation at any speed desired. Cylinder block cast separate from crankcase, enabling user to replace damaged part without purchasing new engine. Renewable valve seat inserts used both on intake and exhaust. Length, 24 in.; height, 23 in.; width 21½ in.—**Wisconsin Motor Corp., Milwaukee, Wis.**

★ ★ ★

STREAMLINED ELECTRIC TIE TAMPERS for track and roadbed maintenance are recommended by their manufacturers because of their ability to tamp track in general out-of-face surfacing, to spot tamp in any ballast with little or no raise and to dig up old, cemented or fouled ballast for cleaning and retamping, for improving drainage and when making tie renewals. Machine has blades adapted to various types of job, such as (1) 3½-in.-wide, rock blade with ¾-in. tip used

for tamping in heavy rock 1 in. or more in size and in low lifts up to 2 in.; (2) gravel or rock blade, 6 in. wide, ¾ in. tip for tamping ballast not more than 1 in. in size, crushed slag or gravel; (3) gravel blade 9 in. wide, ¾ in. tip, used for tamping light ballast, also small rock and slag when raise of 2 in. or more is made; (4) pick tamping blade—shorter than blade described un-



der (3) and has serrated, renewable tip. For tamping rock or coarse slag where considerable raise is made; (5) adjustable digging and tamping blade with blunt ends of reversible tines down for tamping and spotting operations—will drive ballast under and tighten up loose or pumping ties; (6) adjustable digging and tamping blade with sharp or pointed ends of reversible tines down—for loosening hard-cemented and foul ballast and for other operations where pick would be used. Jackson tampers are operated by WS-4 power plant which can supply power for four units, occupies space 20x28 in. and weighs 375 lb. Generator 3-phase 110 v., 60-70 cycle, self-excited, fully inclosed, ball bearing, capacity, 2 kva. Engine, 4 to 5 hp., single cylinder, 4-cycle, forced draft, air-cooled. Triple V-belt drive. Wheelbarrow-type base, heavy-duty pneumatic wheels. — **Electric Tamper & Equipment Co., Ludington, Mich.**

-Here's Fast Material Handling for you!

NOVO Hoists

● Up goes 4374 cu. ft. of concrete a day and the brick, mortar and other material for 14 brick layers. That's to the fifth floor of the new John Deere Building in Lansing, Michigan. Just a day's work for this Novo 2-drum (5500# line pull at 160 fpm) Hoist owned by the Dorr D. Granger Construction Company, contractors on this job.

The set-up is a combination material elevator and a 18½ cu. ft. concrete bucket tower operated by this 2-drum NOVO.

The superintendent was loud in his praise of the ease and economy of operation even with such high production.

Here are the very obvious reasons why such performance is obtained:

Big, rugged, heavy-duty, 6-cylinder, 40 HP industrial engines furnish ample power. No dangerous or wasteful operation from an overloaded engine.

Easy control with Novo screw thrust which puts a tremendous leverage behind the shifter rod. Operator can pick up the heaviest load with little effort.

Smooth, fast, safe action with Novo double cone friction blocks. They take hold of both sides of the friction groove – twice the effective friction area.

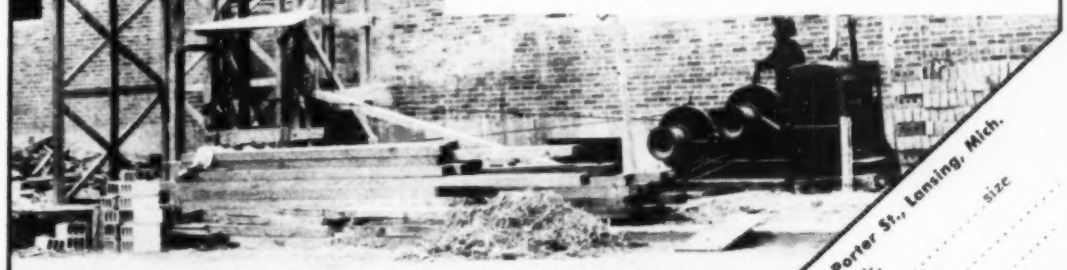
Self-energizing brakes. The drop of the load helps set the brakes resulting in easy handling.

Roller chain drive gives efficient quiet transmission of power. The chain action is like a roller bearing. The links roll friction-free into the teeth of the sprocket.

Pillow block bearings – the drum shaft bearing caps are counter-sunk into the hoist frame. The pull of the line is taken by the frame and not the bearing caps.

Special high steel content chrome nickel alloy used for drums and frame.

Send the coupon for Hoist Data Book.



NOVO ENGINE COMPANY
LANSING, MICHIGAN

NOVO ENGINE CO., 215 Porter St., Lansing, Mich.
Send me Hoist Data Book.
Especially interested in ..... size
Name .....
Address .....
City ..... State .....

FOR CONCRETE REASONS
Contractors Prefer STERLING WHEELBARROWS

Sterling Models S-17, S-18 and S-19 are also used for general purpose work, handling sand, gravel, brick, etc. In this service, they have a maximum capacity of 4, 4½ and 5 cubic feet, respectively.

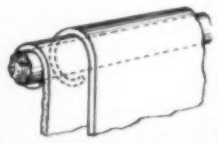
FOR concrete work, Sterling Models S-17, S-18 and S-19 are selected by leading Contractors because of these outstanding features:

Perfect Balance 10-Spoke Wheels
Self-Lubricating Bearings
Welded Trays Heavy Tray Rod
Malleable Wheel Guards
Channel Steel Legs
Square-Bent Leg Shoes
Interchangeable Parts
Malleable Iron Wheel Brackets
Hard Maple Handles

Capacities, 3, 3½ and 4 cu. ft. struck.
Complete stocks available from Warehouses and Distributors in principal cities.

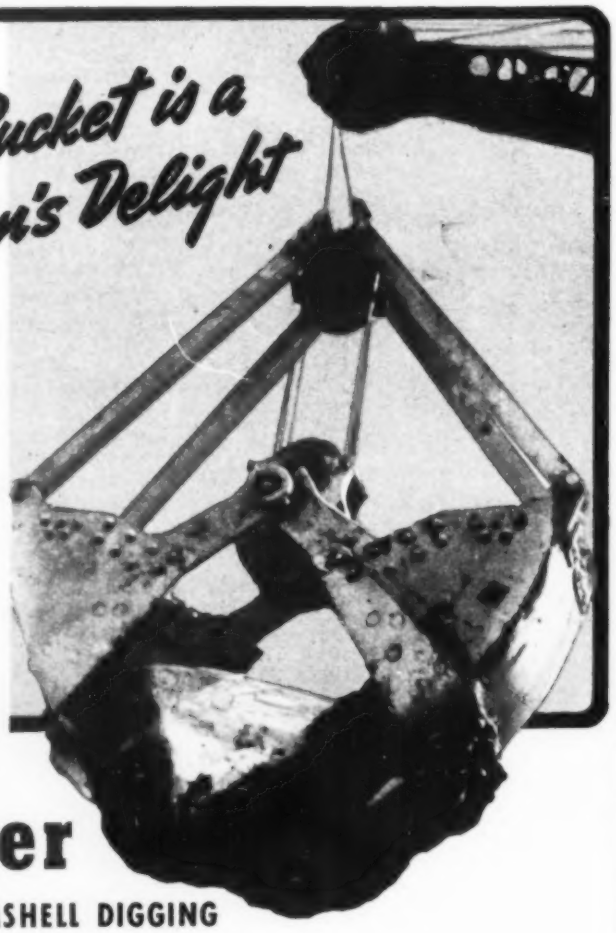
STERLING WHEELBARROW COMPANY
MILWAUKEE, WISCONSIN

An Exclusive Sterling Feature
Where tray sheets lap, both thicknesses are folded over the continuous butt-welded reinforcing rod, thus giving additional rigidity and strength.



A Haiss Bucket is a Crane Man's Delight

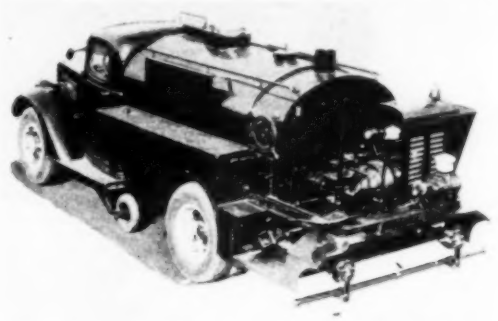
Power to grab and "rassel" a boulder out of sticky clay .... Power to dig in any ground .... Power in its closing gear, power in its jaws and teeth, power in its Haiss-design. Write or wire for prices. All sizes.



HAISS
Hi-Power
FOR PAY LOAD CLAMSHELL DIGGING

In stock at New York, Philadelphia, Baltimore, Birmingham, Atlanta, Hartford, Harrisburg & Los Angeles
GEORGE HAISS MFG. CO., INC., 139th ST. & CANAL PLACE, NEW YORK—DISTRIBUTORS EVERYWHERE

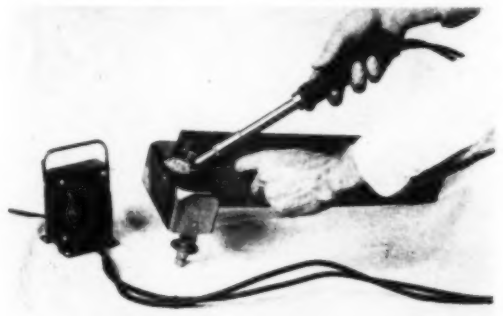
NEW PRESSURE DISTRIBUTOR combines continuous heat flue system, Littleford pressure burner, instant-cut-off spray bar, pump and valve heating chamber,



pneumatic-tired tachometer and single valve control. Capacities from 500 to 3,000 gal. Spray bars up to 24 ft. may be used. Made in truck-mounted or semi-trailer design. — **Littleford Bros., 443-457 E. Pearl St., Cincinnati, Ohio.**

★ ★ ★

SOLDERING IRON provides heat in less than minute, according to its makers who recommend it for all ordinary soldering purposes because it is small and light in weight for easy manipulation. Almost instantaneous heating is made possible by use of special carbon electrode heating element which brings tip quickly up to soldering tempera-



ture and makes contact at point so that heat is concentrated where it is most effective. Heating controlled by thumb-operated button on handle and continues as long as button is held down so that current is used only when iron is in use. Not recommended for continuous duty. Complete assembly includes transformer, soldering iron and leads. Transformer rating: (intermittent) 500 watts, 110/6 v., 50-60 cycle. Other voltages and frequencies available. Shipping weight, 9 lb.—**Ideal Commutator Dresser Co., Sycamore, Ill.**

★ ★ ★

TRAVELING GRIZZLY FEEDER said to solve problem of proper feed to primary crusher by assuring steady stream of rock, by handling large rocks without delay and by by-passing small material around crusher. Feeds long rocks end first into crusher

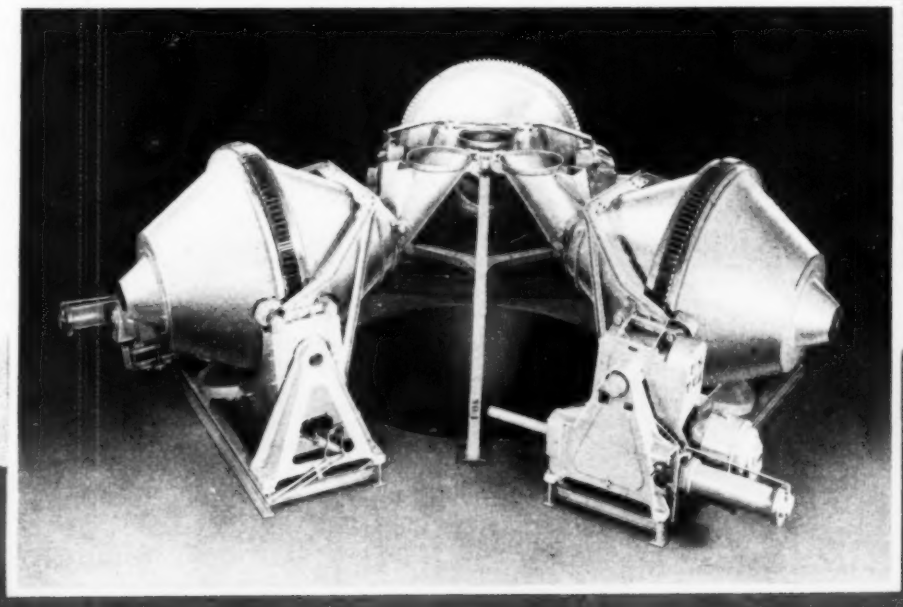
opening, eliminates choking and prevents bridging. Clutch, with controls on operator's platform, permits accurate regulation of feed. If rock is too large for crusher, feeder is stopped, rock broken by sledge and feeder started with no delay to crusher. Excess soil in rock is taken care of by screen which can be located below feeder, to reject dirt and permit transit of rock to conveyor along with product from primary crusher.—**Pioneer Engineering Works, Inc., 1515 Central Ave., Minneapolis, Minn.**

. . . AND NOW IT'S *Cherokee Dam!*

Again Smith Mixers were chosen to mix the concrete for a world-famous project. This time it's TVA's Cherokee Dam at Jefferson City, Tenn. Three Smith 4-yard Front End Charging Tilters — the largest concrete mixers in the world—will soon be working on this huge construction job.

The amazingly successful performance of the three Smith 2-yard Tilters at TVA's Watts Bar Dam, prompted the engineers to select the same make of mixer for the Cherokee project. At Watts Bar, concrete is actually being produced at the rate of 101 batches per hour—*the maximum theoretical capacity of the plant* — and this tremendous production is being maintained, day after day. Again we ask you — could any other concrete mixer give such service?

The T. L. SMITH CO., 2851 N. 32nd St., Milwaukee, Wis., U.S.A.



SMITH

SMITH MIXERS

USED ON THE WORLD'S GREATEST CONCRETE PROJECTS

Your name stamped in Gold on this book FREE

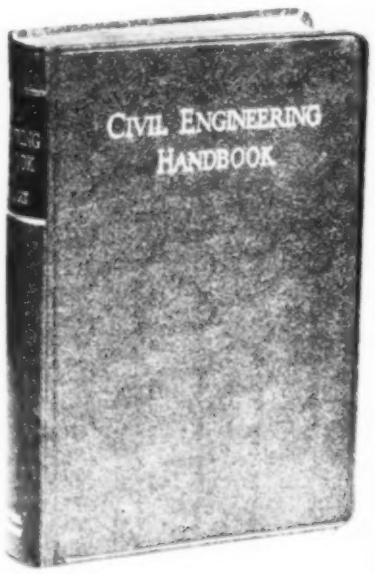
At no additional cost to you, we will stamp your name, or a friend's name, in gold on the front cover of any copy of Urquhart's *Civil Engineering Handbook*, New 1940 Edition, ordered from this advertisement. This is a special Christmas Offer, limited to acceptance before January 1, 1941.

CIVIL ENGINEERING HANDBOOK

Editor-in-chief: Leonard C. Urquhart, Professor of Structural Engineering, Cornell University. Second Edition, 870 pages, 6 x 9, over 900 illustrations and diagrams $5.00

HERE are the fundamentals of the various subdivisions of civil engineering for men who actually plan, select, design, and construct civil engineering structures and projects. In each division a noteworthy specialist has contributed a compact treatise, developing fundamental theories as well as stating more involved ones, making the book not only a comprehensive reference work of modern civil engineering practice, but also adaptable for systematic study of any of the fields represented in it.

In this new edition you will find latest surveying practice carefully defined; new developments in highway and railroad work thoroughly covered; specialized recent data on design and construction of framed structures; new specifications for concrete and steel design to conform to latest approved specifications; important new data on foundations, sewerage and water supply.



Here in one handy volume is the practical, up-to-date information you need on:—

—Stadia surveying
—Land surveying
—Topographic mapping
—Hydrographic surveying
—Railway turnouts, connecting tracks and crossings
—Widening, spiraling and banking of highway pavements;
—Highway administration and finance;
—Highway materials and tests;
—Construction costs of roads and pavements
Mechanics of Materials
—Fluid pressure
—Pipes and open channels
—Flow of viscous fluids
—Measurement of flowing water
—Roof trusses
—Dead-load stresses in bridge trusses
—Lateral forces on bridge trusses
—Arches
—Slope-deflection
—Moment distribution
—Riveting and welding
—Bearing plates and grillage beams
—Bridges
—Mill Buildings
—Multi-story buildings
—Design of concrete mixtures
—Mixers and mixing
—Buildings and walls, footings and foundations
—Concrete arches
—Box culverts and rectangular frames
—Properties of soils
—Mechanics of soil resistance
—Caissons
—Underpinning
Sewerage and Sewage Disposal
—Intakes and dams
—Ground water
—Aqueducts and pipe lines
—Pumps and motors
—Quality of water
—Water purification

Free Gold Stamping

Do you want to make a friend a gift combining personal thoughtfulness with real utility? Do you want a copy of this helpful book that you will doubly prize? Then take advantage of this free stamping offer. Send the coupon today. (Proper remittance should be enclosed with order and, of course, stamped copies are not returnable.)

Everything about this new handbook points to its usability; its large page size, large illustrations and type size; its many illustrative problems; and the comprehensive selection of reference tables and formulas to augment the text matter.

SPECIAL HOLIDAY OFFER COUPON

McGraw-Hill Book Co., Inc., 330 W. 42nd St., N. Y. C.

Send me Urquhart's Civil Engineering Handbook according to terms checked:

☐ With name stamped in gold. I enclose $5.00 and understand stamped books are not returnable. (Offer expires Jan. 1, 1941.)

☐ For 10 days' examination; without gold stamping. I will send $5.00 plus few cents postage in 10 days or return book postpaid. (Postage prepaid if cash accompanies order.)

Print name to be stamped, here

Name .....

Address .....

City and State .....

Position .....

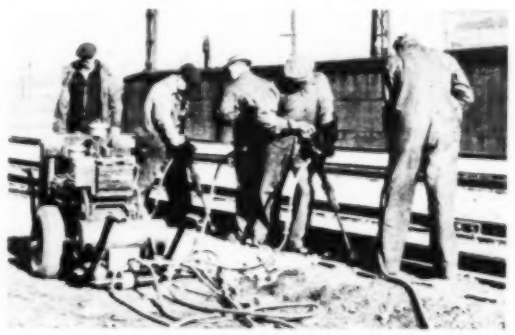
Company ..... CM. 11-40

TRACTOR UNIT, smallest size machine of Tournapull line for speedy, long haul earth moving, is offered in combination with Model LS Carryall scraper to form self-loading unit with struck capacity of 8.2 cu.yd. and heaped of 11 cu.yd. Tournapull is powered by Caterpillar 4-cycle, 6-cylinder diesel engine with top speed of 13 to 15 m.p.h., developing maximum brake horsepower of 90 at 1,800 r.p.m. To supply greatest possible traction per pound of weight, entire weight of engine and

half weight of Carryall scraper and its load are placed on two large pneumatic-tired drive wheels, front wheels being eliminated. Spread of tires caused by weight of unit and additional weight of load increases gripping power and traction. Steering by independent operation of two drive wheels permits short turning and easy maneuvering in close quarters. Advantages claimed: (1) Speed said to compare favorably with that of large trucks; (2) Tournapulls are able to negotiate adverse ground conditions impossible for road-bound trucks; (3) economies of tractor-scraper operation are extended to truck haul jobs, making longer and more difficult hauls faster and cheaper.—**R. G. Le Tourneau, Inc., Peoria, Ill.**

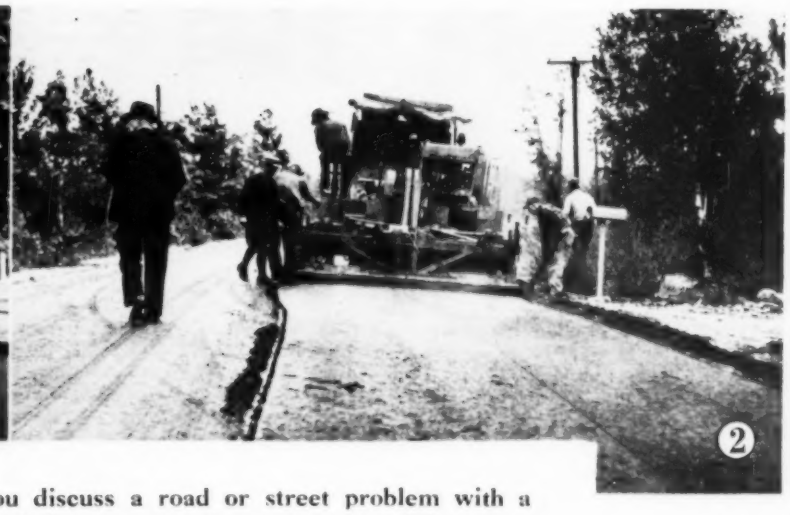
★ ★ ★

PORTABLE AIR COMPRESSOR, called "Tampair", capacity, 60 cu.ft. per minute, is designed especially for railroads where quick spot tie-tamping operations are necessary. Equipped with flanged wheels which allow unit to ride rapidly over rails



and pneumatic tires which permit it to be moved on shoulders without having to use planks or special tracks. Will operate four tie tampers, small rock drill, rotary drills, breakers, spray guns and other air equipment. Powered by 4-cylinder Mercury V-8 engine, 3/16x3¾-in. bore and stroke with speed of 1,390 r.p.m. Unit may be transported long distances on dolly car.—**Schramm, Inc., West Chester, Pa.**

A man who knows ASPHALT



1. Paving with Texaco Sheet Asphalt in Freeport, Ill.

2. Laying an Intermediate-type Texaco Asphalt road in Roscommon County, Mich.

3. Road-mix method of constructing low-cost Texaco Asphalt road in Colorado.

4. Applying a heavy Texaco Asphalt Surfacing Material to Connecticut highway.

When you discuss a road or street problem with a Texaco Asphalt representative, you are talking to a specialist.

This man devotes 100% of his time and his thought to Asphalt.

Consequently he knows Asphalt thoroughly. He understands the special characteristics of every grade, its particular merits and the use for which it is peculiarly fitted.

Texaco Asphalt representatives, who contact road builders in every State east of the Rockies, have averaged approximately 17 years at their jobs; many of them from 20 to 30 years.

For sound, dependable assistance in solving a road or street problem, call in a Texaco Asphalt representative **every time**

TEXACO

REG. T. M.

TEXACO ASPHALT

THE TEXAS COMPANY, Asphalt Sales Department, 135 East 42nd St., New York City

CHICAGO BOSTON PHILADELPHIA RICHMOND HOUSTON KANSAS CITY JACKSONVILLE

★ *from CALIFORNIA*
"Greatly pleased"

★ *from ARIZONA*
"Built right for the work"

★ *from IOWA*
"The hammer has performed excellently"

★ *from ILLINOIS*
"The hammer as well as service is A-1"

★ *from MICHIGAN*
"Oh, Boy! what a hammer"

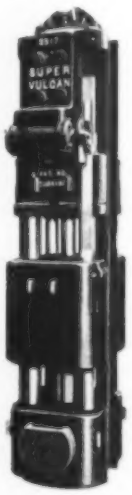
★ *from MASSACHUSETTS*
"It hits a more effective blow"

★ *from FLORIDA*
"A first class addition to our equipment"

★ *from OREGON*
"Very well pleased"

SUPER-VULCAN
Differential Acting
OPEN TYPE
PILE HAMMERS

You too can get exactly the same results that other Vulcan users get —these open-type differential-acting PILE HAMMERS are proving their cost-saving advantages from one end of the country to the other. Find out all the facts about these modern, improved pile hammers. Write direct to us for details or see the Vulcan representative in your locality—get Super-Vulcan benefits for your work—delivers twice the number of blows per minutes — consumes from 25 to 35 per cent less steam — drives more poles per Dollar.



Sizes
18C—30C
50C—80C
meet all needs

VULCAN IRON WORKS Since 1852
331 North Bell Avenue
Chicago Illinois

STEEL SUPPORTS for rock wool batts, called Batznaps, sprung into position between studs without tools, and are said to prevent wool from slipping, buckling and falling backwards. Self-adjusting

for irregular stud spacing. Claimed to eliminate necessity of having paper backing on wool or a binder to hold it together. May be used in studs as far apart as 16 in. actual spacing or in a stud spacing as narrow as 10 in.—**Reardon Rockwool Insulation, 2837 Stanton Ave., Walnut Hills, Cincinnati, Ohio.**

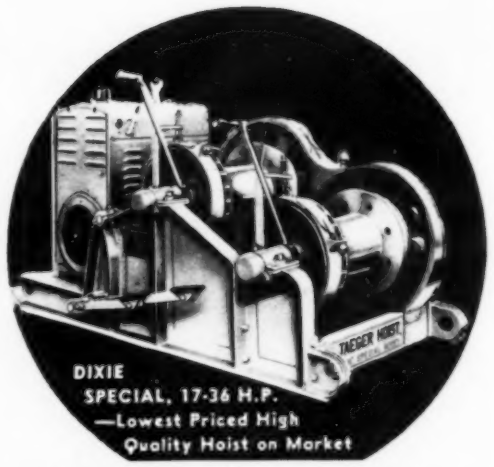
★ ★ ★

NEW PAINT, called Korolac, solution of plasticized poly-vinyl chloride whose basic materials are coke, limestone, and salt, is recommended by its makers fur surfaces wherever corrosive conditions disqualify any other kind of paint or coating. Gives semi-glossy black finish to metal surfaces after they have been coated with new primer designed especially for use with this paint. When thoroughly dry, Korolac is said to be able to withstand all acids, alkalies and salts up to temperature of 150 deg. F. Claimed not to be affected by chrome, nickel, cadmium, zinc, copper, brass, silver or tin plating solution or by atmospheric conditions. Moisture resistant. Dried film said to be resistant to abrasion, yet elastic enough to conform to contraction and expansion of support. Applied either by brushing or spraying.—**B. F. Goodrich Co., Akron, Ohio.**

★ ★ ★

PORTABLE ENGINE-DRIVEN GENERATORS are designed for operation of all types of electrically driven tools as well as floodlighting systems. Powered by air-cooled, 4-cycle, heavy-duty single cylinder engine with flyball governor. Magneto with impulse coupling mounted outside. Oil bath air

cleaner. Generator of double ball-bearing construction is driven through flexible couplings and operates at medium speed. Two-wheel, pneumatic-tire mounting. Sizes from 800 to 25,000 w., a.c. or d.c. All units may be supplied with metal housing equipped with ventilating louvers for weather protection. Each generator has multiple outlet box with three Hubbel twistlock receptacles to provide for use of several tools at one time.—**Griffin Wellpoint Corp., 725 E. 140th St., New York City.**

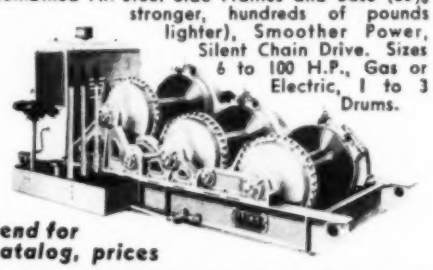


JAEGER Builds the MODERN HOIST

● FINGER-TIP CONTROL of Loads up to 100 H.P. thru Giant Expanding Frictions or Clutches.

● ANTI-FRICTION BEARINGS, replacing babbitt or bushings, on all heavy duty models.

Combined All-Steel Side Frames and Base (50% stronger, hundreds of pounds lighter), Smoother Power, Silent Chain Drive. Sizes 6 to 100 H.P., Gas or Electric, 1 to 3 Drums.



Send for catalog, prices

THE JAEGER MACHINE CO
800 Dublin Ave., Columbus, Ohio

● THE *NEW* WAY TO DRILL HOLES IN CONCRETE, TILE, etc.

50-75% FASTER!

Amazing new drill-point contains special metal harder than hardest steel. Goes through concrete, tile, slate, porcelain, etc., 50 to 75% faster. Drills cleaner, more accurate holes. Speeds up installation of expansion anchors. Saves your skilled time for more profitable work. Eliminates noisy hammering, monotonous chiseling. Doesn't splinter fragile work. No special equipment needed—use in any rotary drill. Get *your* share of those extra profits now possible. Send coupon for leaflet.

CARBOLOY COMPANY, INC.
DETROIT, MICHIGAN

Carboloy Co., Inc.
11125 E. 8 Mile St., Detroit
Send free leaflet on Carboloy Masonry Drill-Points, for drilling concrete 75% faster.

Name_____

Company_____

Street_____

City_____ **State**_____

CARBOLOY
MASONRY DRILL-POINTS

1ST IN POWER... 1ST IN ECONOMY *and* 1ST *in* EASY HANDLING

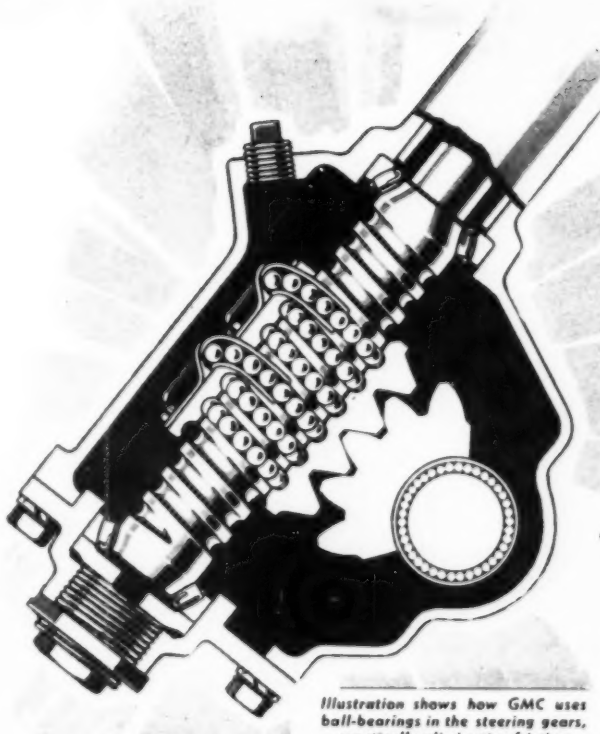


Illustration shows how GMC uses ball-bearings in the steering gears, practically eliminating friction

General Motors Trucks have the *strongest-pulling* engines in the industry, size for size. Owners say GMCs are also the *most economical* on gasoline! And drivers will tell you that GMCs are the *easiest handling* of all big trucks. Tests prove their Ball-Bearing Steering reduces steering effort as much as 57%.

Ball-Bearing Steering

GMC pioneered this great *driver comfort and safety* feature. . . . Try a GMC and *feel the difference!* And notice, too, how GMC's Syncro-Mesh Transmissions (standard in all heavy-duty models) make gearshifting as quick and easy as in your car. Even though you don't drive your own trucks, GMC's easy-handling features are important to you, because they speed up operations and save driver energy on every kind of hauling job.

Our own YMAC Time Payment Plan assures you of lowest available rates

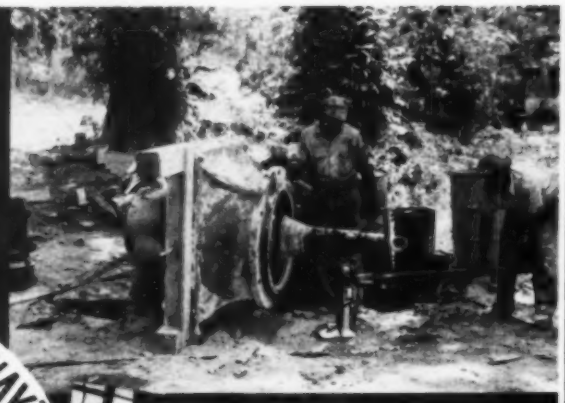
THE TRUCK OF VALUE

GMC TRUCKS

GASOLINE • DIESEL

ONLY GMC TRUCKS GIVE YOU ALL THIS EXTRA VALUE

SUPER-DUTY Engines with gas-saving TURBO-TOP Pistons • RIDER-EASE Cabs with form fitting seats and Quick-Vision Instrument Panels • BALL-BEARING Steering • SYNCRO-MESH Transmissions (in heavy-duty models) • SEALED-BEAM Headlamps



DO TOUGH JOBS" THE EASY WAY"

with Simplex Jacks!

Put the "screws" on those back-breaking jobs. One man and a Simplex Jack can do more work faster and safer than a gang of men without a jack.

There are scores of jobs on every construction project that can be speeded up, done with less man-power and at far lower cost if Simplex Jacks are being wisely used.

On your next job, leave those pushing, pulling, lifting, lowering, supporting, placement and maintenance jobs to Simplex Jacks.

There's a Simplex for every job — many jobs for every Simplex. Screw Jacks in 38 sizes; Automatic Raising and Lowering Jacks from 5 to 20 tons capacities in several heights; Geared Jacks, Journal Jacks from 15 to 50 tons; Pipe Pushing and Pulling Jacks and others; Special Jacks for providing gradient in bridge approaches and other specially engineered jacks for the construction industry.

Ask your supply house.

TEMPLETON, KENLY & CO.
CHICAGO, ILL.
Better, Safer Construction Jacks Since 1899

SIMPLEX Jacks

Awarded the Gold Medal for Safety

Send for Simplex Catalog 40.

small TRAILERS *too* ···

ROGERS HEAVY DUTY Roosevelt Trailers

embody ROGERS

time-proven fundamental features of design —

which have been tested under all kinds of most-severe service. In *any* Rogers Trailer you obtain the maximum in proven construction, in ease of control, in safety and in all 'round value.

ROGERS BROTHERS CORPORATION

220 ORCHARD STREET • ALBION, PA.

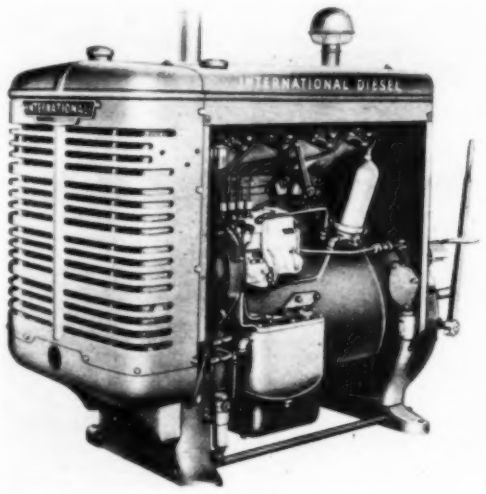
EXPERIENCE • *built it* •
PERFORMANCE • *sold it* •

DIRECT-CURRENT ARC WELDER, 200-amp. capacity, claims to supply any welding current from 25 to 250 amp., permitting all-day manual welding to be done with currents up to 200 amp., using electrodes from 1/16 to 3/16 in. in diameter. Capacity also provided for use of electrodes as large as ¼ in. on occasional short jobs. Two outstanding

features listed by maker: (1) Provides for instant recovery of voltage to an extent greater than arc voltage after each short circuit, thus preventing time-wasting arc pop-outs; (2) does not allow current peaks to exceed three times steady short-circuit current on any adjustment, thus preventing excessive heat and spatter and resulting in saving of electrodes. Other advantages: Excellent commutation, isothermic overload protection for motor, self excitation which obviates need for extra generating unit; quick adjustment of welding current and horizontal mounting. — **General Electric Co., Schenectady, N. Y.**

★ ★ ★

THREE DIESEL POWER UNITS — UD-6 which develops 39 hp. at 1,500 r.p.m.; UD-9 which develops 53 hp. at 1,500 r.p.m.; and UD-14 which develops 66½ hp. at 1,300 r.p.m.—are equipped to start on gasoline and after minute or less shift to full diesel operation. When change-over is made, spark plugs, carburetors and auxiliary combustion chambers used on gasoline cycle are shut off and have no connection with diesel operation. Standard 12-v.



electric starting system may be used to provide electric starting. Other features: four-cycle, valve-in-head design; long-life cylinders with full-length jackets; full pressure lubrication through drilled passages; oil pump with Floto screen; Tocco-hardened crankshaft; heavy-duty precision bearings; by-pass type, thermostatically controlled cooling; full-floating water pump shaft; full-floating piston pins; variable-speed governor; large-diameter flywheel; large capacity oil-bath type air cleaner; renewable element oil filters. Model UD-6 has 3⅞x5¼-in. bore and stroke; piston displacement of 247.7 cu.in. is 62 9/16 in. long, 25⅜ in. wide, 50¼ in. high and weighs 1,765 lb. UD-9 has 4.4x5.5-in. bore and stroke, piston displacement of 334.5 cu.in., is 67¾ in. long, 26⅞ in. wide, 52 in. high and weighs 2,085 lb. UD-14 has 4¾x6½-in. bore and stroke, piston displacement of 460.7 cu.in., is 78 in. long, 33⅛ in. wide, 56½ in. high and weighs 2,585 lb.—**International Harvester Co., 180 N. Michigan Ave., Chicago, Ill.**

Keeps Engines Cleaner
Lubricates Better

BASICALLY DIFFERENT LUBRICATING OIL

Removes Hard Carbon

Higher Resistance to Heat and Oxidation

Non-Corrosive

3 to 10 Times Stronger Protective Film

ADDS POWER
SAVES WEAR
SAVES FUEL
SAVES LAY-UP TIME

LION *Naturalube*

MOTOR OIL and DIESEL & HEAVY DUTY OIL*

Naturalube is really fitted for the tough jobs. Naturalube's 3 to 10 times stronger film is the highest-type protection against the pounding and straining encountered in emergency overloads . . . Furthermore, Naturalube conserves power by keeping engines cleaner. Its unusual solvent and penetrative properties gradually remove hard carbon from pistons, rings and valves. Thus, horsepower is added — fuel is saved — and engine wear is reduced. See for yourself what Naturalube can do. Put it in engines assigned to the toughest jobs. You can depend on Naturalube to "come through" on severe assignments.

* ***Naturalube Diesel and Heavy Duty Oil is specially fortified or reinforced to resist the effects of intensified heat and oxidation under extreme conditions. Engines constantly operated at high speeds and/or heavy loads need this super lubricant.***

For visible proof of Naturalube's money-saving properties and details of money-back guarantee phone the nearest Lion Naturalube dealer or write Lion Oil Refining Company, El Dorado, Arkansas.

Made by **LION OIL REFINING CO., El Dorado, Ark.**

LION PETROLEUM PRODUCTS

BEFORE

YOU BUY ANY HALF-BAG MIXER

SEND FOR THIS BOOK!

If you're looking for a 3½S Mixer that's sturdy and rugged, for dependable service with no time out for repairs—that's well balanced on cantilever springs, mounted on pneumatic-tired wheels for fast and easy towing and spotting on the job—that has a patented drum design for better mixing in less time, an accident-proof hand wheel drum lock and dozens of other high quality features, send for your copy of this new book! It describes thoroughly the background and design features behind the well-known Rex Tilter—the ideal main mixer on small concrete jobs or a cost-reducing "odd-jobber" on larger projects.

FREE SEND FOR YOUR COPY!

Let this book help you in comparing the Rex against all others in its class! You'll find that feature by feature, the Rex 3½S is built to give a larger return on your investment! Also ask for new 1940 catalogs on any other of the Rex Mixers which interest you. Sizes 3½S to 14S, end or side discharge 2- or 4-wheel types. Chain Belt Company, Dept. M-11, 1664 West Bruce Street, Milwaukee, Wisconsin.

DONT DELAY-SEND TODAY!

BUY REX AND BE RIGHT!

MIXERS

NEWS FROM MANUFACTURERS *About Their Products*

The publications reviewed below, will keep you posted on latest developments in construction equipment and materials available for your use

GENERAL PURPOSE HOIST—**American Hoist & Derrick Co.**, St. Paul, Minn. (4-p. folder, illustrated.) Features of this Model 20 contractor's small gasoline or electric-powered hoist, with 8-in.-diameter drum and single-line pull from 1,000 to 2,000 lb., are: Frictions and brakes at opposite ends of drum to promote cool running; shrouded ratchet ring with chisel type dog; drive shaft, with anti-friction bearings, placed between drum gears; frictions of improved band type. Available in single and double-drum models.

★ ★ ★

CLEANING CONTRACTORS' EQUIPMENT—**Magnus Chemical Co.**, Garwood, N. J. (16 pp.) A series of detailed performance reports from highway and other contractors, outlining improvements and economies affected by the use of properly selected cleaners for motors and chassis, bodies, machinery, radiators, sludge and gum control in motors, floors, etc., contrasted with previously used methods. Company's product Magnusol is a solution which may be applied by spraying to remove grease, dirt road oil from all types of construction equipment. Also designed for internal cleaning of motors and for removal of oil, dirt and grease from cement floors.

★ ★ ★

SHINGLE ROOFING — **Certain-teed Products Corp.**, 100 E. 42nd St., New York City (24 pp., illustrated). Carrying title, "The Certain-teed Way to Roots of Beauty," catalog is characterized by use of vivid color reproductions of company's shingle line. Among types illustrated are Woodtex, Thick-Butt, Hexagonal, Universal, Three-Tab Hexagonal, Speed-lay, French Lock, Cut-Out, Jumbo Individual, Dutch Lap; and Thick-Butt and Hexagonal Siding. Section devoted to each type of shingle is featured by sketch of house with which roofing style best harmonizes. Copy emphasizes fact that in selection of new roof, proper color choice is as important a consideration as protection and fire-resistance.

★ ★ ★

CONTRACTOR'S TIME BOOK—**Universal Atlas Cement Co.**, 135 East 42nd St., New York, N. Y., (48 pp. 4¼x7¼-in. size.) Pages of blank forms to be filled in for a complete wage record of contractors' personnel in conformity with requirements of social security legislation. Contains summary of state and Federal social security requirements on old age benefits, unemployment compensation, records, social security numbers and special reports. Time pages in book provide space in ruled columns for tax deductions, tax exemptions, regular time, overtime, etc. There is also a table of wages, with rates per hour at 2½-c. intervals, facilitating quick determination of pay.

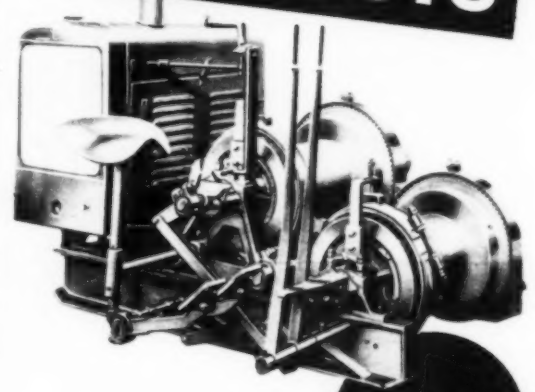
★ ★ ★

FORM-HOLDING EQUIPMENT—**Samuel S. Colt**, 113 North Center St., Orange, N. J. (12 pp., illustrated.) Covers variety of devices for assembling and stripping forms for concrete work, including wire puller, rod clamp, wire twister, nut-washer, spreader washer, cone coupler, spreader rod and rod puller. Detailed drawings illustrate operation of this equipment on forms of various types for both light and heavy construction.

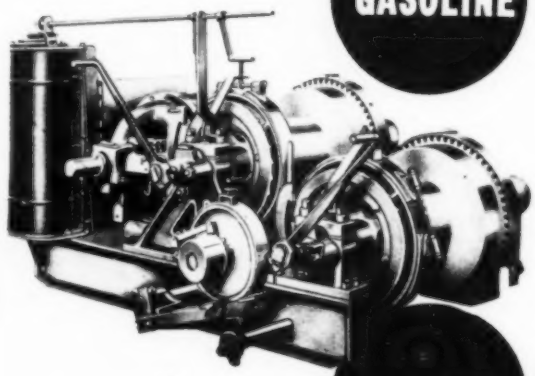
★ ★ ★

SELECTING LOW VOLTAGE POWER CABLE—**General Electric Co.**, Schenectady, N. Y. (20 pp., illustrated.) Condensed guide to aid in selection of insulated cable contains: (1) Summary of types and applications; (2) details of types, including prices; (3) how to select conductor sizes. Other bulletins available to interested users of cable: (1) How to Select Insulated Cable; (2) Aerial Cable; (3) How to Make Cable Joints — Leaded Cable; (4) How to Make Cable Joints — Non-Leaded Cable; (5) How to Make Cable Joints — Portable Cable.

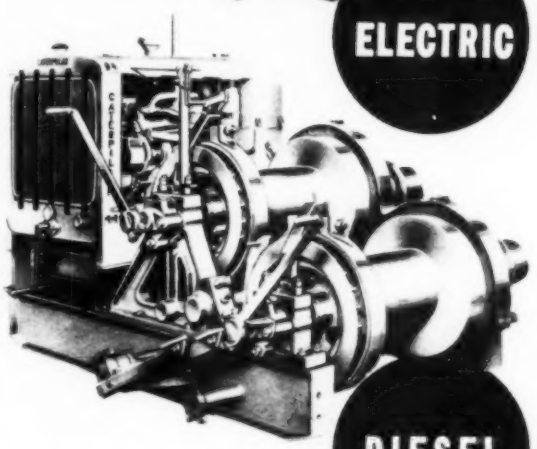
CLYDE . . . HOISTS



GASOLINE



ELECTRIC



DIESEL

CLYDE HOISTS . . .

long lasting equipment of proven durability.

No "one-job" machines of questionable durability when you buy Clydes, but high quality hoists that will give you safe and economical service for years and years to come.

Put a Clyde to work on your next job and profit from its low operating and maintenance costs.

Send for Bulletin K-34

"You'll take pride in your Clyde"

CLYDE IRON WORKS, Inc.

DULUTH, MINN.

ANGLEFLOW PUMPS—**Fairbanks, Morse & Co.,** 600 S. Michigan Ave., Chicago, Ill. (16 pp., illustrated). Describes and illustrates new line of Angleflow pumps in both vertical and horizontal types for benefit of consulting and industrial engineers and others engaged in design, construction, operation and maintenance of large capacity pumping operations such as land drainage, flood control, irrigation, stormwater disposal, municipal pumping, excavation unwatering, cofferdams, dry docks and condenser circulating. According to manufacturers, line of pumps described sets new trend in large capacity pumping units for use in lower head range, combining advantages both of radial flow Francis runner type of centrifugal pump and axial flow diffuser type of propeller pump. Hydraulic stream flow through impeller is at an angle to axis of rotation (center of pump shaft) giving pump its name. Both horizontal and vertical shaft types of Angleflow pumps are provided in standard sizes up to 54-in. discharge and in special larger sizes, depending upon job requirement.

★ ★ ★

ARC-WELDING HAND BOOK — **Lincoln Electric Co.,** 12,818 Coit Road, Cleveland, Ohio. (1,125 pages, with 1,557 illustrations; price $1.50) Sixth edition, revised, of well-known "Procedure Hand Book of Arc-Welding Design and Practice," constituting an encyclopedia of welding practice. Eight chapters cover welding methods and equipment; technique of welding; procedures, speeds and costs; structure and properties of weld metal; weldability of metals; design for steel machinery construction; design for arc-welded structures; and typical applications. This monumental volume contains much new data, the result of two years of fact-finding by a staff of 200 application engineers contacting every industry.

★ ★ ★

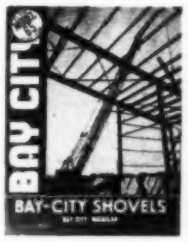
PRESSURE-TREATED HIGHWAY POSTS—**Wood Preserving Corp.,** Pittsburgh, Pa. (4 pp., illustrated.) Illustrates uses and lists advantages of pressure-treated timber posts, as follows: (1) lower cost; (2) stronger under impact; (3) lower annual cost; (4) outlive untreated posts and are more uniform in size; (5) reduced maintenance expense. Posts, of two types, round or rectangular in cross-section, are pressure-treated with metallic salts in aqueous solution (chromated zinc chloride, Wolman salts) which evaporate, precipitating salts in wood; or creosoted by pressure to retain 6 or 8 lb. of Grade 1 creosote. Salt-treated posts may be painted with aluminum paint such as Koppers Lumino or with white paint but are not considered as durable at ground line as pressure-creosoted posts which may be satisfactorily painted with aluminum.

★ ★ ★

CONCRETE MIXERS AND EQUIPMENT—**Ransome Concrete Machinery Co.,** Dunellen, N. J. (2-p. bulletin, illustrated). Birdseye view of entire line of mixers, pneumatic placers, buckets, carts, bins, towers, mast plants and other equipment used around mixers.

★ ★ ★

SHOVELS AND CRANES—**Bay City Shovels, Inc.,** Bay City, Mich. (12-p. catalog ½-yd. shovel; 12-p. catalog, heavy-duty truck crane; 12-p. catalog 1¼-yd. convertible shovel — all illustrated). First catalog reviews number of important design and construction refinements in ½-yd. shovel, including inclosed heavy-duty swingers running in oil; under drums adding to cable capacity; drums in ball bearings and roller bearings in "E-Z" clutch wheel giving smoother action; simplified clutch adjustment with hands reversible and interchangeable. Second catalog describes two types of truck cranes—Standard having lifting capacity of 16½ tons and Special providing for handling of heavy loads, higher lifts, longer reach and greater capacity of 20 tons. Latter machine furnished with collapsible Hi-A frame, safety independent boom hoist, special boom hoist bridle with socketed cable lengths and pin-connected booms up to approximately 110 ft. with adjustable jibs or gooseneck. Third catalog describes and illustrates heavy-duty 1¼-yd. convertible shovel with 20-ton crane rating. Includes complete specifications, working ranges for shovel, dragline and trench hoe and crane ratings at various boom radii.



IT'S TELLURIUM 4400-VOLT CABLE

Still Alive and Working

ACCORDING to our reporter, the cables shown are tellurium-rubber types in use on a coal-stripping operation. The large one supplies power at 4400 volts to a 30-cubic-yard stripping shovel.

After having been twisted in that muck and run over by trucks, neither cable showed a single leak or break. So far as we know, both are still supplying power at their rated voltages. Many other users report stories of similar harsh treatment, with similar results—little or no trouble. That's why, with tellurium, you can count on saving money by reducing maintenance cost.

If you have need for a tough cable that doesn't mind being dragged through mud or over sharp rocks and gravel, tellurium is your buy. This cable, specially designed for mining machinery, gathering locomotives, electric shovels—for all portable uses—will save you money both on replacements and upkeep.

In addition to tellurium, G.E. has other types of insulated cable to fit every one of your particular needs. If your jobber can't supply you, or if you would like special information, see the nearest G-E Office, or write directly to General Electric, Schenectady, N. Y.

GENERAL ELECTRIC INSULATED CABLE
ALWAYS THE RIGHT TYPE FOR EACH JOB

GENERAL ELECTRIC
500-20A

AN OWEN GRAPPLE

will furnish THE SOLUTION

Special jobs often require special tools and while rock handling problems are doubtless common to many, OWEN has perfected and proved the special tool for this job in the Type RA Rock Grapple. Revolutionary, independent tine action, enormous lifting capacity and other exclusive features distinguish it decidedly from other equipment intended for like use. *Write for the new catalog, just off the press.*

THE OWEN BUCKET CO.

6020 BREAKWATER AVE., CLEVELAND, OHIO

Branches: New York, Chicago, Philadelphia, Berkeley, Cal.

ON THE SKYLINE DRIVE

These 3 Schramm "Utility" 315 cu.ft. Diesel Driven Compressors are operating 3 Wagon Drills on the extension of the Skyline Drive in Virginia. The 3 Diesels use a total of 120 gallons of fuel oil per 10 hour day. Diesels have electric starting, of course.

TELESCOPIC HOISTS—**Gar Wood Industries, Inc.,** 7924 Riopelle St., Detroit, Mich. (6-p. folder illustrated) Photographs and short descriptions of single- and dual-cylinder, hydraulically operated telescopic hoists capacities up to 50 tons. Three basic types are offered: (1) Single-cylinder underbody; (2) dual-cylinder underbody; (3) single-cylinder vertical. Single-cylinder type permits low mounting of body. Dual-cylinder type multiplies lifting power in proportion to larger loads handled. Vertical type particularly adapted to extra long bodies of trailers and 6-wheel trucks, with variety of strokes available according to body length and dumping angle required. Exclusive feature: two continuous tubular cross-members employed to support hoist—either inside or outside mounted—to chassis frame.

* * *

Aircraft Plant Addition

BUILT IN 90 DAYS

(Continued from page 45)

vide unobstructed floor space. All roof trusses are designed to carry 5-ton overhead cranes, three per bay. In all, the plant expansion required 2,300 tons of steel.

Substructure—Preparation of the site began with excavating for the underground access tunnels which was done with two power shovels, a Bucyrus-Erie and a Northwest, two LeTourneau carryalls and four Caterpillar bulldozers. The truck fleet included three 10-cu. yd. 6-wheel trucks that worked equally well forward or backward. This eliminated much turning, and on short hauls, kept costs down.

Although the sand which comprised most of the material to be excavated would stand only on a rather flat slope, it was found more economical, by reason of low excavation costs, to make the trench tops wide enough so that timbering was not required, except in the 3 ft. which was below water level in the bottoms of the trenches. Thus, very little time and expense was required for the timbering; concrete forms began to go up as soon as the shovels backed away from trenches cut down to grade. The shovels were rigged to use the buckets as hoes.

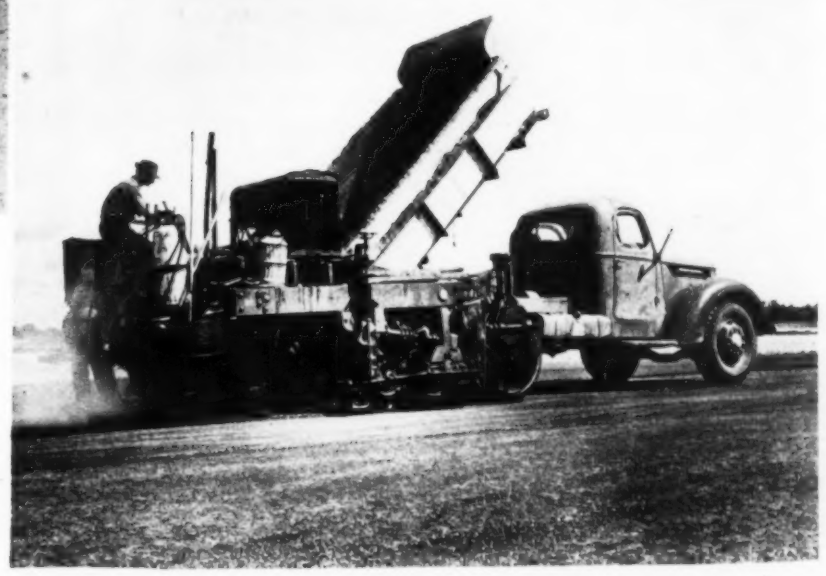
To keep the water down when and where required, in the individual footings and in separate portions of the trench system, ditches were dug at strategic points draining into a central sump and from this one collection point a stationary, 6-in. pump discharged into the nearby Duwamish waterway. Discharging into this drainage system were portable pumps, two 4-in. and four 2-in., which were moved about the job as required to unwater any particular section as needed. Gasoline engines operated all pumps.

Piledriving Methods

For the piledriving, which was heavy on the waterway side of the location and involved a total of 3,250 creosoted timber piles ranging up to 35 ft. in length, 6 pile-

(Continued on page 102)

RUNWAYS *for* DEFENSE . . .



Built by ADNUNS

McCHORD FIELD, Military Air Base at Tacoma, — Four 150 ft. runways, 6000 to 8000 ft. long — over 136,000 sq. yds. of asphaltic concrete put down with an Adnun Black Top Paver at full speed in two courses — 2″ base, 1″ top course. Roughometer tests showed total deflections of only 17″ per mile — far better than specifications required! Contractor Warren-Northwest, Inc.

•

OTHER ADNUN-LAID AIRPORTS

ABERDEEN, MARYLAND
CLEVELAND, OHIO
NASHVILLE, TENN.
COLUMBIA, S. C.
ROCHESTER, MINN.
WASHINGTON NAT'L. AIRPORT, GRAVELLY PT., VA.
CHICAGO MUNICIPAL AIRPORT

And many others!

RUNWAYS for defense demand SPEED, ACCURACY AND SMOOTHNESS! And no machine can meet these demands like an Adnun BlackTop Paver. Here's why: *Adnun Continuous Course Correction* levels out irregularities in the course to produce a smoothness of surface that would be impossible or prohibitive in cost with other methods.

The Adnun Cutter Bar with the overlapping and compacting action produces joints *under pressure* that are as tight and positive as the rest of the pavement — *a feature of unusual importance on airport work where joints between many parallel courses must be made.* Proper handling and laying of material with an Adnun provides a safe, non-skid surface that more than meets airport demands. And Adnun economy and dependability make big jobs run smoothly and profitably —Adnuns have a simplicity of design and a ruggedness of construction found in no other black top machines—they'll move fast on the job day after day without constant attention and repairs. They'll handle any type of mix—hot or cold. They'll lay any width and thickness—base or surface. They have effortless hydraulic controls for fast, easy operation.

These and many other Adnun advantages will give you the edge on any airport work. Write for the Adnun Catalog and Airport Bulletin before you bid on your next job.

THE FOOTE COMPANY, INC., NUNDA, NEW YORK

ADNUN
TRADE MARK REGISTERED

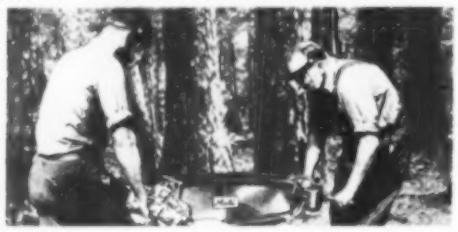
BLACK TOP PAVER

MULTIFOOTE CONCRETE PAVERS AND ADNUN FINISH SPREADERS

IT'S EASY TO CUT COSTS WITH Mall POWER TOOLS SAVE TIME AND LABOR!

Model 85 Mall Saw
8½" blade—Cutting capacity 2¼"
Other models 6½" to 12"

You get more power, speed, safety and ease of operation for the money with an electric MALLSAW. Each MALLSAW is designed so that the motor and the greatest part of the weight rests on the long end of the material to be cut, providing maximum safety and balance for one-hand operation. Each model has swivel base for angle cuts and patented approved safety guard.



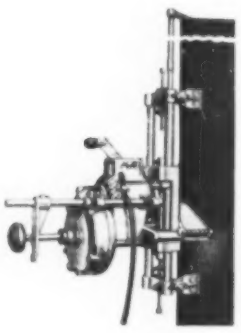
CHAIN SAWS — Gasoline Engine, Air and Electrically Driven. For cutting off piles, tree felling, cutting large timbers and lumber. Indispensable to contractors, railroads, bridge builders, public utilities, forestry departments and road builders. Compactness, lightweight and portability have been built into these saws to make them the easiest serviced, fastest cutting chain saws on the market. Do heavy timber cutting economically. Sizes 24" to 108".

CONCRETE VIBRATORS — Gasoline Engine, Air and Electric Sets. For compacting concrete in all types of structures. A dozen models to choose from. 1¼", 2⅜" or 3¼" diameter vibrating elements. Attachments for SAWING, PUMPING, SURFACING and DRILLING.

CONCRETE SURFACERS. For removing fins and board marks after forms are stripped. Gasoline and electric sets. Can be furnished as additional attachments for MALL concrete vibrating units.

DOOR PLANES. Provide an accurate method for fitting sash, transoms and doors. Ten times as many doors can be fitted with this method and better, too!

SURFACE PLANES. This tool replaces the old style jack plane. It is ten times faster. Savings in labor can be made that never before were considered possible. Ideal for large planing jobs!



DOOR LOCK MORTISER. You can mortise a door a minute with this tool! Cuts complete lock barrel and face plate mortise in one operation. Pays for itself on the first large door hanging job.

Send for complete information and ask for a free demonstration. MALL representatives in principal cities of the United States and Canada are prepared to demonstrate these cost cutting tools without obligation or cost. Fill in and mail the coupon today!

MALL TOOL COMPANY, 7757 South Chicago Ave., Chicago, Illinois
Without cost or obligation, please send bulletins on MALL tools. We are especially interested in.....
Name .....
Address .....
City..... State.....

(Continued from page 100)

drivers were used. Only three steam hammers were available, so in addition three of the old, drop-hammer type were also pressed into service.

Material Handling

Excavated material was trucked to two storage piles and left there while the concrete tunnels were being poured. Material then was loaded back on to the trucks, hauled to place and spread in 9-in. layers, with the aid of bulldozers. A fire-hose was used to wet down the fill as it was compacted by trucks and bulldozers. Hand tamping was done close to the concrete walls of the tunnels where tractors and trucks could not get in close.

The larger storage pile, in which the excavated material had been dumped, covered an area of some 150x400 ft. to a depth of about 10 ft. Excavation had been planned so that the return of all excavated material alongside the concrete structures, when compacted in place, just brought the fill up to grade. As the material was practically all sand, no top dressing was required in preparing the graded surface for the reception of the concrete paving. Paving is 5 in. thick inside the buildings and 6 in., reinforced, in outside paved areas. Concrete was mixed on the job in a centrally located plant and trucked to the paving crews.

Superstructure

Steel erection progressed smoothly and despite the fact that fabrication had been farmed out to a number of eastern plants (because of the need for haste and because of the local steel-workers' strike), everything fitted together and went up in a minimum of time. The 50-ft. trusses for the saw-tooth roof that came to Seattle knocked down for shipment, were put together at the plant of the Pacific Car & Foundry Co., loaded back on to railroad cars and hauled by rail right into the building area. Special trailers, on each of which one of the 50-ft. trusses could be carried in a horizontal position, were used to haul the trusses within convenient reach of the erection cranes.

Six crawler cranes were used in steel erection. Two of these were the shovels used in excavation, equipped with boom in place of bucket and dipper stick. The 200-ft. trusses came to the job in three sections. The two end sections were erected first and their projecting ends were supported temporarily on portable timber A-frames while the central section was being hoisted to place. The A-frames were equipped with jacks for convenience in setting the trusses.

With the steel roof trusses went up the timber purlins which were hoisted and placed by the same crews, the union requirements being merely that carpenters receive the timbers. With the purlins in place the remainder of the roof materials, beginning with planking, were hoisted with a portable A-frame or Chicago boom rig and small electric hoist.

Siding for the buildings was put on from timber scaffolds built on skids so

(Continued on page 104)

CUT PLACING COSTS as much as $45 A DAY

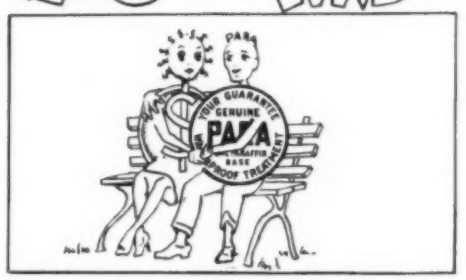
Jaeger "Hoister" and Self-Raising Tower!

Quickly assembled on ground and raised by its 17 H.P. "Hoister"—moves around job on its own skids — handles full ton loads, largest concrete cart or 2 barrows. Standard height 37 ft., add 10 ft. sections up to 67 ft. Saves real money — pays out in no time. Get our price.

JAEGER HOISTS — 6 to 100 H.P. — today's leading line — advanced features, low prices. Ask for Catalog H-40.

THE JAEGER MACHINE CO.
800 Dublin Avenue, Columbus, Ohio

HAND IN HAND



Your DOLLARS INVESTED IN CONSTRUCTION JOBS NEED THE PROTECTION OF

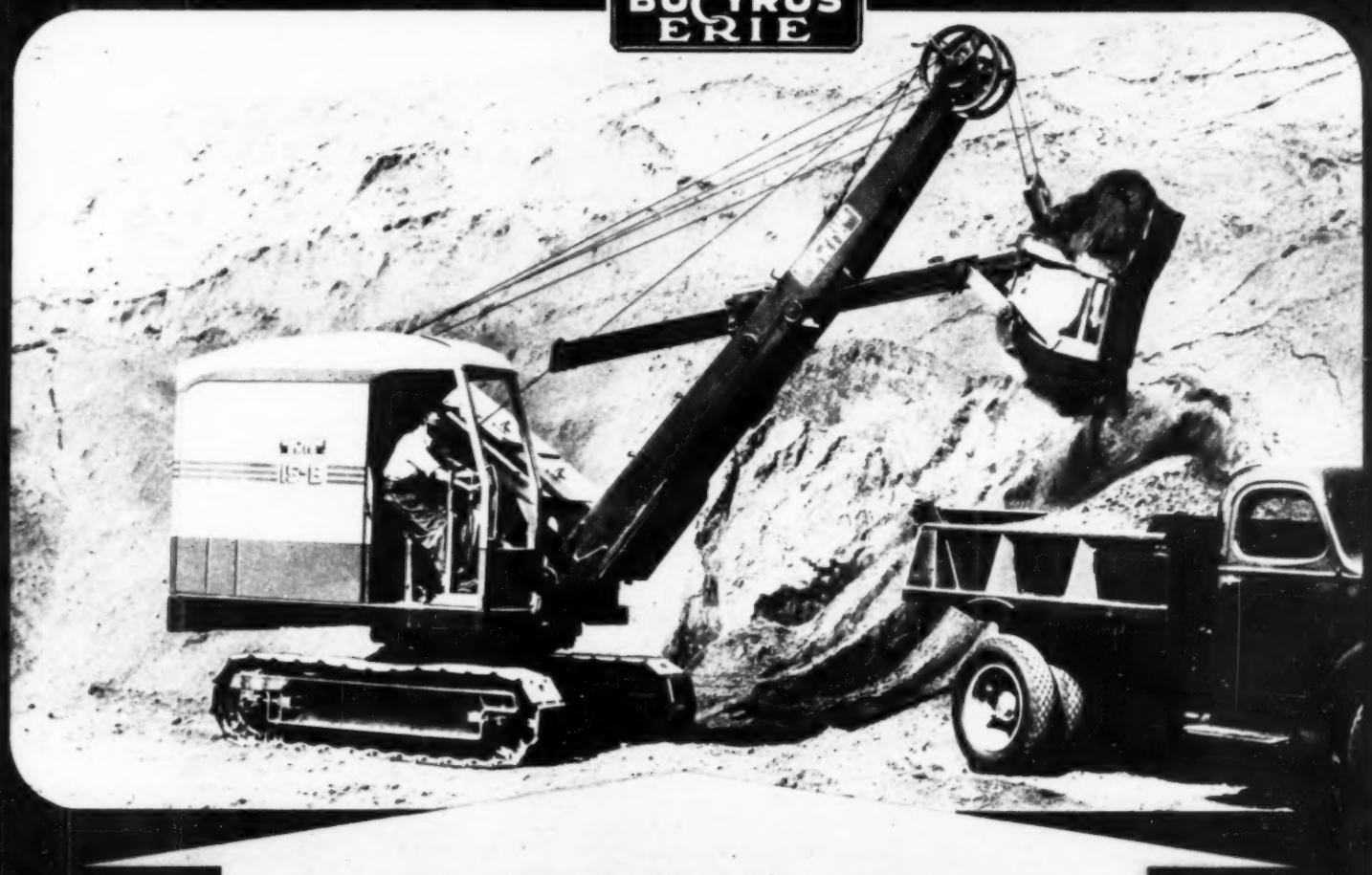
PARA WATERPROOFED TARPAULINS

DISTRIBUTORS EVERYWHERE
MFD. BY
H. WENZEL TENT & DUCK CO.
1035 PAUL ST.
ST. LOUIS, MISSOURI

Announcing

The NEW ½ YARD 15-B

BUCYRUS ERIE



- A basically new machine: neither a stretched ⅜-yard nor an under-powered ¾-yard.
- Transmission chain and all gears (except swing gear and pinion), enclosed and run in oil.
- Anti-friction bearings for every power transmitting part on revolving frame used in digging cycle.
- Conical hook swing rollers increase lifting capacity per pound of weight.
- Fully independent boom hoist gives power-controlled raising and lowering.
- Five duplicate, single-point-adjustment clutches.
- Independent positive twin-rope crowd.

WRITE FOR BULLETIN ON THE NEW 15-B.

B46

Bucyrus·Erie

SOUTH MILWAUKEE, WISCONSIN

TRACTION . . .
NOT POWER ALONE IS WHAT YOU NEED

YOU SAVE MONEY! Take a truck of 1½ to 3 tons original capacity and let us quickly and at a low cost convert it to a husky unit of 30,000 lbs. or more gross vehicle weight capacity.

Two ratios, for power and speed, easily controlled by a lever in the cab. Walking-Beam Flexibility — Special spring construction keeps equal load on all four driving wheels — and balanced power.

SPRING ASSEMBLY

Thornton spring suspension is one of the finest contributions to truck design. Massive dual springs, multi-leaf type, are center pivoted on the projecting ends of trunnion tubes which extend from transfer case through brackets on each side-frame. At their ends, these dual springs are mounted by rotatable shackles to the axles. This affords maximum useful flexibility. Axles are ideally spaced for easy turning, reduced tire scrub, proper load support and road and load shock absorption.

★

When there's heavy work to do, TWO driving axles under the load are better than one. For better traction and load flotation use the

THORNTON FOUR-REAR-WHEEL DRIVE

THORNTON TANDEM CO.
8701-8779 Grinnell Ave. Detroit, Mich.
Manufacturers also of the THORNTON automatic-locking DIFFERENTIAL which gives traction when slippery going makes trucks equipped with ordinary differentials helpless.
"When you need TRACTION you need THORNTON"

that a tractor could pull them along to new positions as the work progressed.

For The Austin Co., which built the plant addition for the Boeing Aircraft Co., W. R. Engstrom was district manager and Richard Ellis, engineer. During the peak of activity 1,200 men were employed on construction operations.

★ ★ ★

HARD-ROCK MINERS ADVANCE
Five Rounds Per Day

(Continued from page 57)

ing the various features of its Saugatuck development, which includes a concrete dam and dike in addition to the water supply line. In accordance with its tested practice on past projects, the company planted the entire job with new equipment, purchasing popular sizes and power ranges with a view to quick resale at good prices after the work is completed.

Tunnel Excavation — Both tunnels are in Waterbury gneiss, which breaks clean around the periphery of the tunnel but does not shatter well. The rock requires no timbering and only a minimum of scaling. Drill bits dull rapidly in the hard gneiss and must be changed for every 18 in. of hole. Average rock excavation line is 2 in. outside the 7-ft. 8-in. horseshoe section, and the quantity of excavated rock is 1.83 cu.yd. per linear foot.

Headings of both tunnels were started from the inner portals, which face each other across the narrow valley. After completing the shorter bore, which rises on a very slight upgrade toward the reservoir, the tunnel plant was moved across the valley to the portal of the longer tunnel.

Electric energy and compressed air for tunnel construction are obtained from two gasoline-powered compressors and a diesel-electric a.c. generator which runs a blower, a water pump and a battery-charging a.c.-d.c. motor-generator set to service storage battery locomotives. The 220-v. output of the diesel-driven a.c. generator is stepped down to 110 v. for lighting. Locomotives, muck trains, mucking machine and drill carriage operate over 24-in.-gage track of new 25-lb. rail laid on wooden ties. The mucking machine is a compact, air-powered excavator which hoists its bucket to cast broken rock into an attached car at the rear. For convenience, three wet drifter drills are mounted on a job-built drill jumbo, although only two drills are operated at a time.

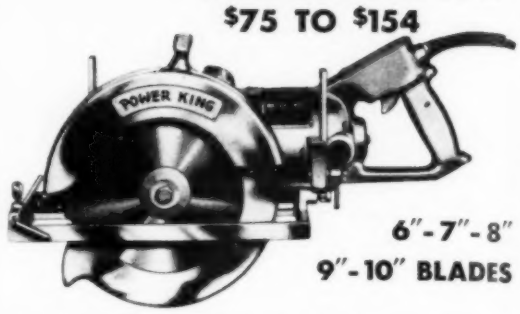
Electric Power

Cost of running an electric power line in to the site would have been about $35,000. To save this expense, the builders installed at the tunnel a General Motors 60-

(Continued on page 106)

Power King
"TOOLS OF TESTED QUALITY"

MULTISAWS
$75 TO $154



6"-7"-8"
9"-10" BLADES

Radial ARM *Available for Production Work*

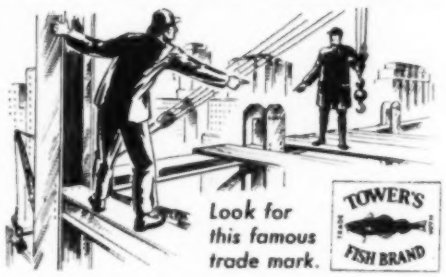
Quick sawing, anyplace on the job — without the work and expense of transporting and setting up heavy equipment — is the contribution of the Power King Multisaws to modern construction methods.

The Multisaw is lightweight and compact. Has quick-acting pistol grip and switch control; balanced lift grip; dust blower for clear vision; thumb locked ripping guide; quick-change arbor for blades, abrasive discs, dados; swivel base for quick depth changes and bevel cuts. 7 ball bearings, helical and spiral-bevel gears insure smooth performance and long service life.

Automatic telescoping guard meets the most rigid safety codes. Each Multisaw comes in carrying case with grease gun. Motor is universal DC or AC 60 cycles or less, 110 or 220 volts. Ask your equipment jobber or send for complete details.

POWER KING TOOL CORP.
1115 E. MARKET ST., WARSAW, INDIANA

MEN-*get complete all weather protection with* **TOWER'S RUBBERIZED**
(A LATEX PRODUCT)
SUITS, COATS and HATS



Look for this famous trade mark.

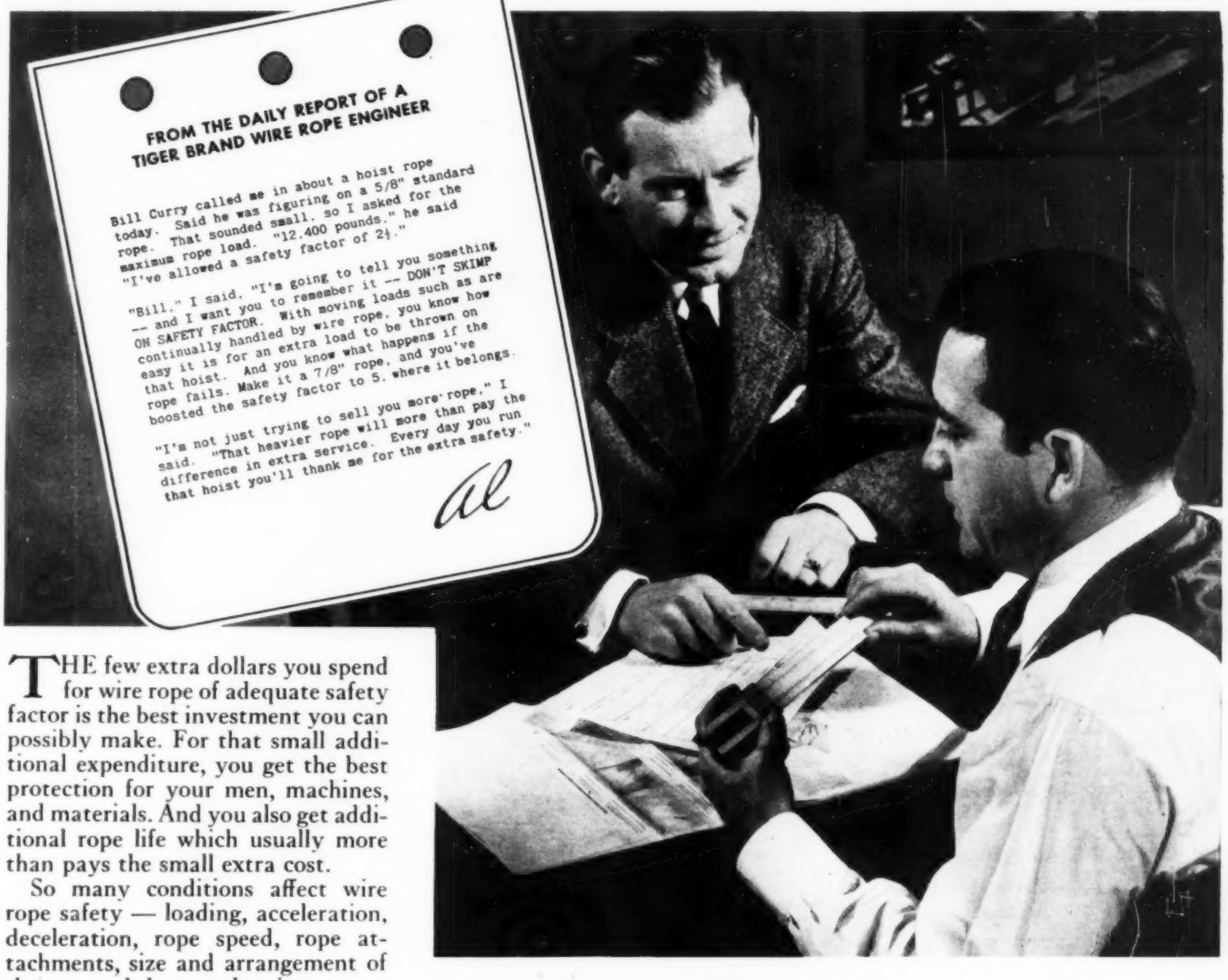
Tower's waterproof, rubberized work clothing gives dependable, durable performance. Medium weight and designed to give the utmost in freedom of movement and comfort. No cemented seams to pull apart. A choice of styles and full line of sizes to fit every requirement. Unaffected by high or low temperatures.

Also available in oiled type garments if desired.

Sold by all good Dealers or write for folder CM to

A. J. TOWER CO.
BOSTON, MASS.
Makers of Waterproof Clothing Since 1836

DON'T SKIMP ON SAFETY FACTOR


FROM THE DAILY REPORT OF A
TIGER BRAND WIRE ROPE ENGINEER
Bill Curry called me in about a hoist rope today. Said he was figuring on a 5/8" standard rope. That sounded small, so I asked for the maximum rope load. "12,400 pounds," he said "I've allowed a safety factor of 2½."
"Bill," I said, "I'm going to tell you something -- and I want you to remember it -- DON'T SKIMP ON SAFETY FACTOR. With moving loads such as are continually handled by wire rope, you know how easy it is for an extra load to be thrown on that hoist. And you know what happens if the rope fails. Make it a 7/8" rope, and you've boosted the safety factor to 5, where it belongs.
"I'm not just trying to sell you more rope," I said. "That heavier rope will more than pay the difference in extra service. Every day you run that hoist you'll thank me for the extra safety."
al

THE few extra dollars you spend for wire rope of adequate safety factor is the best investment you can possibly make. For that small additional expenditure, you get the best protection for your men, machines, and materials. And you also get additional rope life which usually more than pays the small extra cost.

So many conditions affect wire rope safety — loading, acceleration, deceleration, rope speed, rope attachments, size and arrangement of sheaves and drums, abrasive or corrosive conditions. Usually one or more of these factors are variable and accordingly, difficult to predict accurately. Therefore, in order to avoid overstressing and subsequent disastrous results, allow adequate safety factors in figuring your wire rope requirements.

In case of doubt about safety factor, ask any American Tiger Brand Wire Rope Engineer. These men bring you, without obligation, all the practical experience gained from thousands of successful installations.

RECOMMENDED MINIMUM SAFETY FACTORS

Track cables	3.2
Guys	3.5
Mine Shafts	
depths to 500 ft.	8.0
depths 500 - 1000 ft.	7.0
depths 1000 - 2000 ft.	6.0
depths 2000 - 3000 ft.	5.0
depths over 3000 ft.	4.0
Miscellaneous hoisting	5.0
Haulage ropes	6.0
Overhead & Gantry cranes	6.0
Jib & Pillar cranes	6.0
Derricks	6.0
Small Electric & Air Hoists	7.0
Hot ladle cranes	8.0
Slings	8.0

USS

EXCELLAY *Preformed* **WIRE ROPE**

AMERICAN STEEL & WIRE COMPANY
Cleveland, Chicago and New York

COLUMBIA STEEL COMPANY
San Francisco

United States Steel Export Company, New York

UNITED STATES STEEL

For greater dragline yardage use a Page Bucket on the job!

Dragline buckets for all types of work · Capacities ⅜ to 15 cubic yards

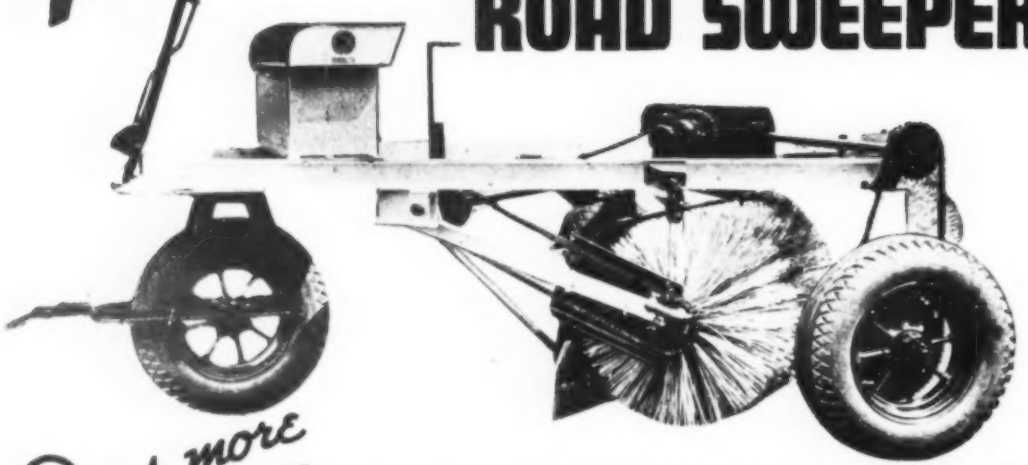
There's a reason why more Page Dragline Buckets are used than any other make. By their yardage records on all types of work, Page Buckets have established a reputation of being able to outdig other buckets of equal size and weight. Get the greatest yardage possible from your dragline machine — dig with a Page Automatic Bucket! See your equipment dealer or write us for more information.

PAGE ENGINEERING COMPANY

Page Automatic Dragline Buckets · Page Walking Dragline Machines

CLEARING POST OFFICE, CHICAGO, ILLINOIS

NEW! **Reliance 3-WHEEL pneumatic tire ROAD SWEEPER**



Does more in less time for less money!

3-Wheel Chassis provides balanced, 3-point suspension. An extremely short turning radius, makes unit exceptionally easy to handle and steer. A new method of raising and lowering gives quick, easy positive control of broom. The frame is all steel construction . . . eliminates a considerable amount of unnecessary weight. The machine is simple, foolproof, durable and costs less to maintain. Send for Catalogs 10 and 28 . . . for complete information about the RELIANCE line of Road Building, Maintenance and Quarry Equipment.

UNIVERSAL ROAD MACHINERY CO.

Kingston, N. Y., U.S.A.

DISTRIBUTORS IN ALL PRINCIPAL CITIES OF U.S.A.

(Continued from page 104)

kw. diesel-electric 220-v. a.c. generator. The generator supplies the 220-v. motors of the blower and water pump directly, but the potential has to be reduced to 110 v. by a voltage regulator for the lighting circuit. To charge storage batteries for the tunnel locomotives, a.c. power is converted to d.c. by a Wotton motor-generator set equipped with a 15-hp. 220-v. a.c. motor. The d.c. generator of this unit furnishes power at 116 v., 93/30 amp., sufficient for charging two batteries of 40 cells each.

Compressed Air

Two Ingersoll-Rand portable gasoline-powered 315-c.f.m. compressors maintain 95-lb. pressure in a 5x10-ft. receiver from which a 3-in. pipe line delivers air into the tunnel. A Hewitt 3-in. bull hose 50 ft. long connects the pipe line with a small receiver on the drill jumbo.

Ventilation

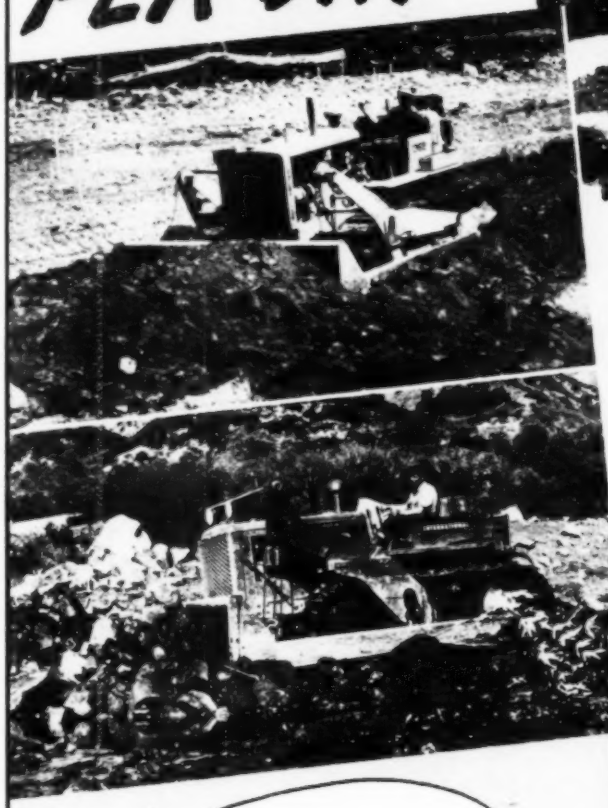
Connecticut state health department regulations require a fresh air supply of 1,200 c.f.m. for each drill operating in the heading. The ventilating equipment is designed to provide for simultaneous operation of two drifters. An Ingersoll-Rand blower with a rated capacity of 2,350 c.f.m. at 1-lb. pressure actually furnishes in excess of 2,500 c.f.m., as indicated by a G.E. meter dial. The blower is driven by a G.E. 15-hp. motor. About 150 ft. of 16-in. metal pipe connects the blower with the tunnel portal. From this point air is delivered to the heading through duPont Ventube 16 in. in diameter, except for the last 100 ft., in which 12-in.-diameter tubing is used.

To avert the incidence of silicosis among men who work in rock containing 10 per cent or more of free silica, state regulations set a maximum dust count per cubic foot of 10,000,000 particles 2 microns (0.002 millimeter) or smaller in size. Concentrations of the minute particles (invisible to the naked eye) exceeding the established maximum are known to be conducive to silicosis. The Waterbury gneiss through which the tunnels are being driven contains 25 to 35 per cent of free silica. Wet drilling is employed to reduce the quantity of dust in the air, and the muck pile is wet down with a hose spray during the mucking operations for the same purpose. In addition, the discharge end of the ventilating tube is kept within about 75 ft. of the working face to assure adequate dilution under the worst conditions, with two drills operating. These methods are effective in keeping the dust count well within the permissible maximum.

When a blast is fired in the heading, rock fragments fly back a distance of several hundred feet, and it is necessary to remove about 200 ft. of ventilating tube before making a blast to avoid having the fabric torn by the flying rock. The light flexible tubing is readily taken down and is as quickly hung again by its suspender hooks on the wire rope cable which supports it. About 5 min. after firing a blast, when the air stream from the blower tube has evacuated the fumes and gases from the heading, the shifter and one man go

(Continued on page 108)

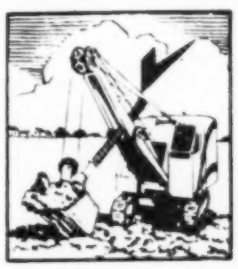
Here's why Buckeye 'Dozers give you MORE YARDAGE PER DAY



BUCKEYE Cable Controlled Bulldozers and Trailbuilders have features found in no other equipment of their type — features that mean more yardage in less time and more profits for you: Plow-like digging action PLUS a blade curvature that rolls the dirt makes possible a higher mold board and bigger payloads with the same power. Blades "hug" front of tractor, reducing load and wear on front idlers and track rolls. Full floating blade, pivoted at drive end of tractor permits high lift and free swinging action up or down. Simple frame with no overhead members means less weight, greater visibility. No cylinders required for down pressure — full cable control with Buckeye G-L-T Power Control Units transmits full engine power for lifting action. Trailbuilder blades adjustable to any desired angle and on many models adjustable horizontally when angled to help equalize load and reduce uneven crawler wear. For maximum yardage at lowest cost, use Buckeye equipment to work with your tractors. Write for full information now. BUCKEYE TRACTION DITCHER COMPANY, Findlay, Ohio.

Check Buckeye First!

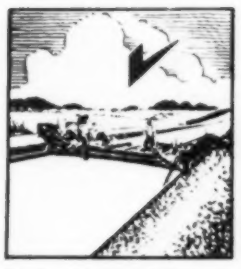
Buckeye



Convertible Shovels...

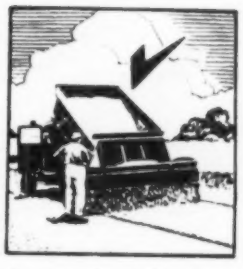
Trenchers .....

Road Wideners .....



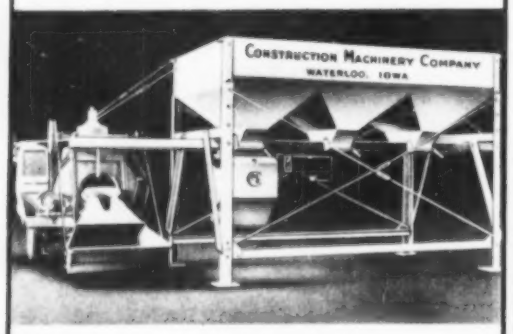
R. B. Finegraders.....

Tractor Equipment....

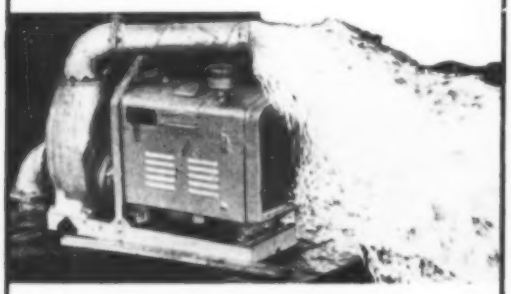


Gravel Spreaders.....

ALWAYS AHEAD WITH MONEY-MAKING EQUIPMENT!

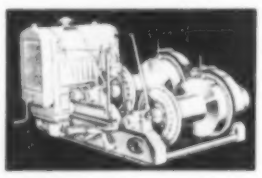


The new CMC Bin Batcher sets a new "high" in profit-making equipment. Takes the advantages of a central mixing plant to every job at remarkably low cost. Used with a CMC 10S or 14S Mixer makes a hard to beat, high producing, cost cutting, concrete producing unit.



CMC DUAL PRIME PUMPS

Doubly fast — doubly sure. Only Dual Prime gives you two priming actions. That means extra dependability. Sizes from 1½" to 10"; also special well point and high pressure pumps.



CMC Hoists — low priced—high quality. Single and double drum up to 40 H. P.

LOOK AT CMC BEFORE BUYING!

See the latest in Mixers, Tilters from 2½ to 10 cu. ft. Non-tilts up to 1 yard. 1 and 2 bag hoe type. Bin batchers, Pumps, Hoists, Power Saws, Carts and Barrows.

CONSTRUCTION MACHINERY COMPANY
WATERLOO, IOWA

(Continued from page 106)

into the tunnel to examine the face and string the 200 ft. of tubing previously removed. At the end of about 25 min., the entire tunnel is cleared, and the crew goes back in to muck the blasted rock.

Transportation

Muck is hauled out of the tunnel and wasted on a dump at the portal by five- and six-car trains of Easton 1½-yd. one-way dump cars equipped with link couplings and Timken roller bearings. Eleven cars are in use. Two Whitcomb 4-ton storage battery locomotives handle the trains and other equipment in and out of the tunnel. Three sets of Exide storage batteries are kept in service to allow charging of one set while the other two are working. The batteries are good for about 8-hr. operation without charging, but this period is lengthened by hooking up the batteries to the generator while a locomotive is standing idle outside the tunnel.

OPTICAL IMPINGER in hands of W. M. MAHONEY, safety engineer of Liberty Mutual Insurance Co., incorporates small piston mechanism for impinging dust samples on glass slide. Microscope mounted on instrument enables operator to count dust particles in sample and compute dust concentration in atmosphere.

To switch empty cars in the heading during the mucking operation, the heading crew uses a cherry picker consisting of a Pul-Lift 1½-ton ratchet chain hoist riding on a trolley beam which is supported from steel roof pins in a widened section of the tunnel. The cherry picker lifts an empty car off the track and moves it to one side, while the locomotive pulls a loaded car back from the mucking shovel. The empty then is replaced on the track to be moved up to the mucker.

Mucking Shovel

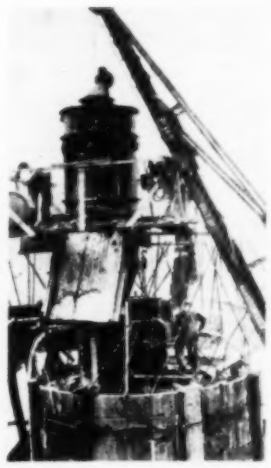
In preparation for loading, the empty car is coupled to a compact Gardner-Denver air-powered mucking shovel which scoops up the broken rock in a 4-cu.ft.

(Continued on page 110)

COMMERCIAL

GIVES YOU *EASIER, FASTER, AND SAFER* CONSTRUCTION ON...

...CAISSONS AND SHAFTS!



Plain liner plates used as external skin and concrete form in pneumatic drop caissons on each side of Flushing River. Gas Service Tunnel, Long Island City, New York.

COMMERCIAL Liner Plates, fabricated without corrugations, find an important application in the field of drop caissons of circular shape. Besides effecting decided savings in decreased construction time, the smooth surface of COMMERCIAL plates materially reduces the skin friction of the surrounding earth. As for vertical shafts, used in collaboration with horizontal tunnels, COMMERCIAL Liner Plates offer a money and materials saving method of driving these shafts. By their use, the shaft may be concreted or reinforced with ribs to make it self-sustaining. Write to us . . . we'll send you detailed information concerning liner plates for *every* tunneling job.

The COMMERCIAL SHEARING & STAMPING CO.
YOUNGSTOWN, OHIO

You Need

NATIONAL CARBIDE LIGHTS

X-200 NATIONAL CARBIDE V. G. LIGHT

Now, more than ever

NATIONAL CARBIDE LIGHTS

are proving their outstanding superiority and value by providing Powerful "Portable Daylight" in all emergencies.

For

PROPERTY PROTECTION
RUSH CONSTRUCTION
EMERGENCY REPAIR

You need one or more on hand, ready for regular duty or instant use.

DEPENDABLE • ECONOMICAL • SAFE

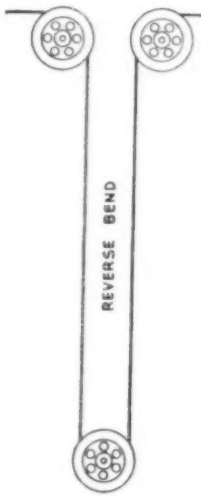
X-200 (as illustrated) with two 8,000 candlepower directional controlled reflectors, is ideal for guard duty on all construction work; for all purposes where an abundance of light is required.

Other Lights available. Write today for circulars showing prices and complete line.

NATIONAL CARBIDE CORPORATION
LINCOLN BLDG., NEW YORK, N. Y.

These Wire Rope "Headaches" Should Be Avoided

Correct working conditions for wire rope are very essential if the rope is to deliver the full service of which it is actually capable. Some of the common causes of wire rope "headaches" are as follows:



REVERSE BENDS

This refers to that kind of bending in which a wire rope first passes around a sheave or drum in one direction and then around another sheave in a diametrically opposite direction. This is an exceedingly severe condition of wire rope service, and it should be avoided wherever possible.

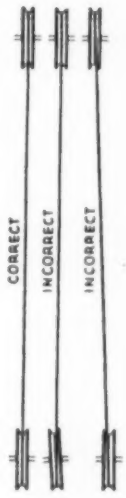
IMPROPER FLEET ANGLE

Wire Rope trouble is sometimes experienced, particularly in mine hoisting, because of an excessive fleet angle. By fleet angle is meant the angle made by a line from the center of the sheave to the center of the drum, with a line from the center of the sheave to the outer side of the drum, as shown in the accompanying illustration.

This angle should not exceed, for best results, one and one-half degrees when smooth drums are used, and two degrees when grooved drums are used. Angles greater than these cause climbing on the drum as the rope approaches the end of the drum, with the resulting grinding and pinching tendencies, and is also likely to cause abrasion at the head sheave.

SHEAVES OUT OF LINE

It is essential for maximum economy, that all rollers, sheaves and drums be in line, otherwise at the point of misalignment there is excessive wear on both the sheaves and rope. Sheaves out of line have been known to have had one flange worn entirely off, which of course caused undue wear on the rope as well.



This advertisement is published for the purpose of helping all wire rope users obtain safe and efficient service from their wire rope. We publish a booklet "Practical Information on the Use and Care of Wire Rope," which covers many other conditions that deserve consideration. We would be glad to send a complimentary copy to anyone interested.

A. LESCHEN & SONS ROPE CO.

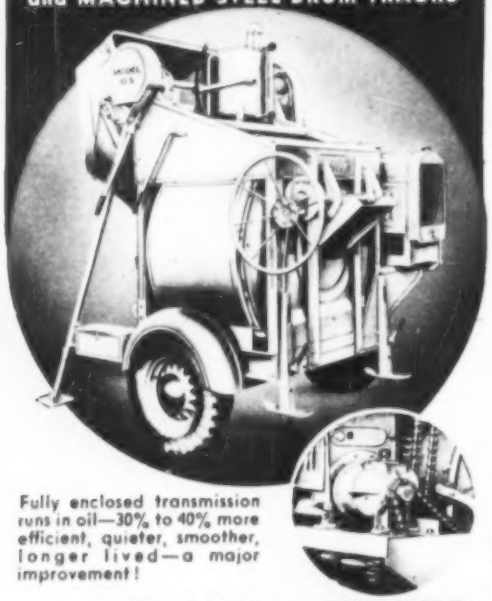
WIRE ROPE MAKERS — ESTABLISHED 1857

5909 KENNERLY AVENUE — ST. LOUIS, MISSOURI, U. S. A.

"HERCULES" (RED STRAND) WIRE ROPE

NEW YORK	90 West Street	SAN FRANCISCO	520 Fourth Street
CHICAGO	810 W. Washington Blvd.	PORTLAND	914 N. W. 14th Avenue
DENVER	1554 Wazee Street	SEATTLE	3410 First Avenue South

MIXERS with AUTOMOTIVE TYPE TRANSMISSION
and MACHINED STEEL DRUM TRACKS



Fully enclosed transmission runs in oil—30% to 40% more efficient, quieter, smoother, longer lived—a major improvement!

. . . Built by JAEGER to Mix Faster, Trail and Handle Easier, Last Longer

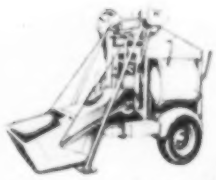
These latest SPEEDLINE Mixers — in 3½S to 56S sizes — have all the features that made Jaeger the world's biggest selling mixers, plus sensational improvements never before offered — AUTOMOTIVE-TYPE TRANSMISSION, 100% BALL BEARING SHAFTS, MACHINED ALLOY STEEL GEARS . . . plus MACHINED, HIGH CARBON STEEL DRUM TRACKS, ON CHILLED, GROUND, CAR-WHEEL ROLLERS . . . plus oversize engines and vital parts.

Here are the huskiest, smoothest running mixers ever built — combining real heavy duty service with easy handling, end discharge trailer design. 2 or 4-wheel mountings interchangeable. Get our new Catalog and prices and compare.

THE JAEGER MACHINE CO.
800 Dublin Avenue, Columbus, Ohio

Tilting Mixers 3½S, 5S, 7S Sizes

3½S End Discharge with Measuring Batch Hopper



5S Home Builders' Mixer Has All Features of Bigger Mixers

14S Trailer With 90" Wide Skip

2 or 4 Wheels

JAEGER SPEEDLINE

(Continued from page 108)

bucket and casts the material backward into the car. The shovel is equipped with two 5-cylinder 9½-hp. air motors, one for the hoist and one for the crowd, each controlled by a separate throttle lever on the side of the machine within easy reach of the operator, who stands on a platform that can be detached readily when the unit is not mucking.

A gear drive from the crowd motor to both axles of the mucking machine propels the unit forward, forcing the bucket into the muck pile. The hoist motor raises the bucket by a chain drive through a cam-and-lever mechanism, with the cam traveling on a geared rack. When the bucket reaches the top of its rise, it strikes a release valve which allows it to drop forward to lowered position. The body of the machine can be rotated by hand on the chassis to clean up the full width of the heading.

Skillful operators manipulate the car loader with great speed and dexterity in the tunnel. Air consumption is about 68 c.f.m. at 80-lb. air pressure.

Drill Carriage

A job-built jumbo constructed under the direction of Superintendent W. C. Merrill consists of a welded tubular frame mounted on the forward extension of a long four-wheel car and fitted with swivel arms for three drills. Only two drills are operated at a time, but a third drill is provided at the top of the jumbo to avoid the difficulty of changing a drifter in the tunnel to reach the upper holes. The side arms of the carriage are swung back against the frame when the jumbo is in transit. Air is supplied to the drills through hose connections from a manifold attached to the small receiver on the carriage.

Drills and Drill Bits

Mounted on the jumbo are three Ingersoll-Rand S70 motor-feed wet drifter drills equipped with combination automatic control valves which turn on air and water simultaneously. The drills have 30-in. runouts, but, because of the hardness of the rock, drill changes are made every 18 in., the drill rods being supplied in lengths of 2½, 4, 5½ and 7 ft. Detachable Ingersoll-Rand bits and Crucible steel rods are used; the bits are always threaded on the rods in a shop outside the tunnel to assure correct selection of bit gages and to eliminate loss of time caused by changing bits in the heading.

Bits are resharpened under a unit price agreement by a blacksmith shop in Bridgeport. A bit is good for 18 in. of drilling before being returned to the shop, and each bit is resharpened three times before being discarded. The total service per bit, therefore, amounts to 6 ft. of drilling, with three resharpenings.

Water Supply

Water for wet drilling and for sprinkling the muck pile is picked up from a brook by an Ingersoll-Rand electric-motor-driven pump and is delivered to the tunnel through a 2-in. pipe equipped at the tunnel portal with a release valve set to pop off at 55-lb. pressure. At a point inside the

HOW TO MAKE YOUR OWN ADVERTISING

ALL SALES no guff

5,000 copies asked for in 1st month; 2nd and *LAST* Printing at bindery now.
Order yours while they last!

A number of advertisers, who have found that it pays to tell all that the business paper readers want to know, have helped A.B.P. assemble a collection of advertisements that illustrate how this simple principle works in selling a wide variety of products. These ads form the major part of a book called "TELL ALL . . . A Practical Guide to Successful Business Paper Advertising." Also described in "TELL ALL" are a number of cases where advertisers using "Tell All" copy have produced the sort of proof of advertising effectiveness to which management is entitled.

If you would help your advertising manager and agency make doubly sure that your business paper advertising is free from the most common form of waste . . . *inadequate copy* . . . send for your copy of "TELL ALL."

The Associated Business Papers
369 Lexington Ave., N. Y. C.

LOOK FOR THE TWOHALL-MARKS OF KNOWN VALUE

ABP — Highest editorial standards and publishing integrity

ABC — Proved reader interest in terms of paid circulation

The Associated Business Papers
Room 2426, 369 Lexington Avenue
New York City

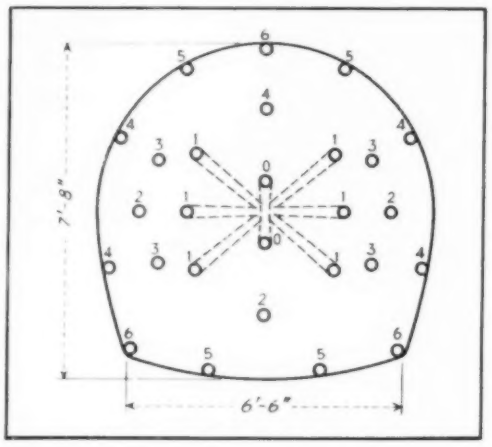
As long as there is no obligation, I'm gambling a postage stamp on the chance of getting a good idea or two from TELL ALL. Send my copy.

Name .....
Position .....
Company .....
Street .....
City and State .....

tunnel, the water pipe reduces to 1-in. diameter.

Drilling Pattern

Although the drilling pattern has to be changed fairly frequently to fit varying rock conditions, a typical round has a total of 27 holes, of which two are baby cut holes 4 ft. deep, fired simultaneously, and six are cut holes 8 ft. deep, fired by No. 1 delays. Surrounding the cone-shaped cut which these holes pull out of the center of the heading are the relievers and rim holes primed with electric delays from No. 2 to No. 6. A typical round of this sort requires 170 ft. of drilling, accomplished by two



TYPICAL DRILLING PATTERN comprises 27 holes, of which two are baby cut holes 4 ft. deep and six are cut holes 8 ft. deep; remaining holes are 6 ft. deep. Holes are fired with six delays, as indicated by numbers.

drills in an average of 2 hr., equal to 42 ft. per hour per drill. Holes pull clear to the bottom, giving 6 ft. of advance with 6 ft. of drilling.

Loading and Firing

To break about 11 cu.yd. of rock involved in 6 ft. of advance, the miners load the holes with 125 lb. of duPont 40 per cent special gelatin, an average of slightly more than 11 lb. of powder per cubic yard. All precautions are taken to avoid accidents during loading and blasting.

After completing the drilling, the jumbo leaves the tunnel, and light and power lines are cut off. Light for making up the primers, loading the holes and connecting the wires of the firing circuit is furnished by a head lamp on a storage battery locomotive. Dynamite and blasting caps are transported separately into the tunnel. DuPont electric blasting caps are used in the primers, which are made up in the heading; Heitzman safety plugs are employed for stemming. Leg wires of the blasting caps are connected in parallel to bare copper bus wires strung around the face.

After the shifter has sent all his men and the storage battery locomotive out of the tunnel, he connects the bus wires to the lead wires and starts toward the portal. Several hundred feet from the face of the heading, he makes the final connection between the lead wires and the main 220-v. blasting line. Immediately upon reaching the tunnel portal, the shifter

(Continued on page 112)

"It's Our Standby!"
says Madden & Lane, Inc. of their
MICHIGAN TRUCK TYPE CRANE

SINGLE AXLE

FOUR-WHEEL DRIVE

DUAL TANDEM DRIVE

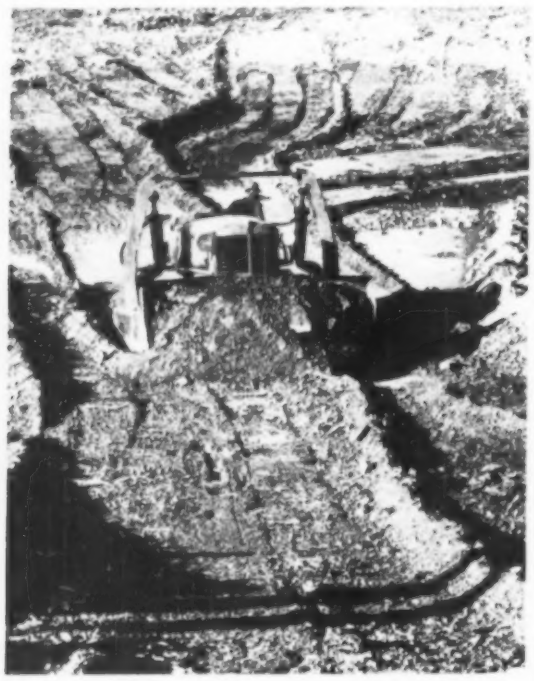
FINGERTIP AIR CONTROLS and QUICK CHANGE-OVER to all regular attachments are standard on all models of the highly mobile MICHIGAN.

"We bought the Michigan two years ago, for complete crane, shovel and back-hoe service," says R. M. Johnson, Madden & Lane, Inc., general contractors, Long Island City. "It has taken out foundations for buildings, rigged as shovel or crane. The back-hoe has handled trenches for sewers and water mains. We are very well satisfied. On the East River Drive in New York we worked the Michigan back-hoe on trenches, encountering boulders, old bulkheads and a variety of hard digging. The machine is equipped with 1/2 yd. clamshell, 1/2 yd. shovel and back-hoe dippers. It has stood up well."

This season, join the ranks of MICHIGAN owners who are reaping greater profits from their small scattered jobs as well as from their larger ones. Write for MICHIGAN WORK BOOK CM-110 today — find out why you could make more money with MICHIGAN TRUCK SHOVELS CRANES.

MICHIGAN POWER SHOVEL Co. BENTON HARBOR, MICHIGAN U.S.A.

HYDRAULIC EQUIPMENT
at Its Very Best!



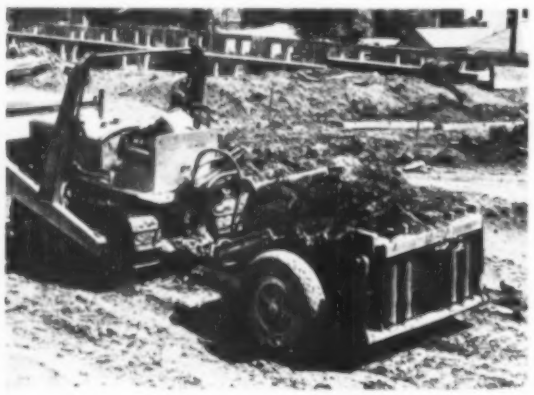
Baker Bulldozer on a reservoir job

BAKER BULLDOZERS

Baker Hydraulic Bulldozers and Gradebuilders are in a class by themselves in performance and construction. Baker engineers have made hydraulic operation easy, accurate and dependable . . . and have built Bakers to handle the toughest jobs. Convertible moldboards, tremendous down pressure and balanced hydraulic system are features of every model. They save the operator's time and increase his efficiency.

BAKER SCRAPERS

Baker Hydraulic Scrapers, in 2, 4 and 6 cu. yd. capacities lead their field in real performance at a minimum fuel cost. They take less horsepower to load because they fill at a flat angle. The cuts are trim and clean—no unsightly holes. Built with hydraulic systems for any tractor of 25 to 60 h.p.



Baker Scraper on a housing project

Ask for special bulletins on Baker Bulldozers and Hydraulic Scrapers.

THE BAKER MFG. CO.
568 Stanford Ave., Springfield, Ill.

BAKER

(Continued from page 111)

goes into the power house, replaces fuses previously removed from the switch box and throws the switch which fires the blast.

Bonus Incentive

Based on a normal weekly advance of 120 ft., a bonus is paid to all tunnel workers for each foot of progress exceeding this average. As a result of the bonus incentive, the miners usually advance the heading five full 6-ft. rounds in 24 hr.

In working at this rate, a complete cycle of drilling, loading and mucking takes 5 hr. Drilling, as already mentioned, consumes 2 hr.; loading, ½ hr.; smoke clearance, ½ hr.; mucking and laying rail, 2 hr.

Bonus-inspired efforts for greater progress are not permitted to lessen the insistence on vigilance and safety precautions. A safety engineer, assigned to a pair of important jobs in the Bridgeport area by the insurance carrier which writes workmen's compensation coverage for both projects, spent more than half his time on the water company's work during the early months and assisted in maintaining a low accident record.

Administration

All operations of the Bridgeport Hydraulic Co. are under the direction of Samuel P. Senior, president and chief engineer. C. M. Blair, New Haven, Conn., is consulting engineer for the Saugatuck development, and William C. Pollitt is the water company's resident engineer.

Construction work on all features of the Saugatuck development is directed by William C. Merrill, superintendent, assisted by Robert Crowe, master mechanic, and Robert Taylor, general concrete foreman. W. M. Mahoney is safety engineer on the project for the Liberty Mutual Insurance Co., Boston, Mass.

* * *

Tall Steel Scaffold
SUPPORTS
37-TON LOAD

(Continued from page 62)

spans, as shown by the photographs, to provide rigidity in the longitudinal direction. In conjunction with this system of anchors and crossbracing, solid planking of one intermediate level produced the desired effect of stabilizing the scaffolding against horizontal movement.

At the working level, 6x8-in. timber ledgers were used on top of base plates inserted in the upper ends of the scaffold legs to support a solid decking of 3x6-in. planks. Eleven limestone blocks, ranging from 8,000 to 14,000 lb. in weight, rested on this deck during the erection of each pediment. The entire scaffold was mounted

(Continued on page 115)

THE OTHER PUMPS QUIT

Results mean more than words. Talk is cheap and anyone can make a lot of unproved claims. But on the job a pump must do its own talking. Try out a G & R pump and then you be the judge.

GORMAN-RUPP PUMPS

AGAIN THE CONTRACTORS BOUGHT GORMAN-RUPP

On the new Shore Parkway project at Brooklyn two centrifugal pumps one an 8-inch and the other a 4-inch, clogged and quit. Two "Can't Clog" G & R 6-inch pumps replaced the quitters and for weeks pumped 24 hours per day.

Gorman-Rupp Pumps Can't Clog. They are not quitters. That's why MORE CONTRACTORS ARE STANDARDIZING ON GORMAN-RUPP PUMPS THAN ANY OTHER MAKE. They will pump MORE WATER and pump MORE HOURS at LESS COST.

Let a Gorman-Rupp Pump prove these statements. Phone our nearest distributor for a trial pump.

PROMPT DELIVERY from Stock in 100 Principal Cities

THE GORMAN-RUPP CO., Mansfield, Ohio

Sure . . .

It's a Jackson Vibrator

FREE—New illustrated folder just off press.

ELECTRIC TAMPER & EQUIPMENT CO.

Ludington Mich.

RPM DELO

is approved by the makers of over 95% of the installed DIESEL HORSEPOWER in America!

Order from Your Nearest Distributor as Listed Below:

IN THE UNITED STATES

RPM DELO:
The California Company (Montana only)
Humble Oil & Refining Company
The Navy Gas and Supply Co. (Colo. only)
Standard Oil Company (Indiana)
Standard Oil Company of Nebraska
Standard Oil Company of California
Standard Oil Company of Texas
Utah Oil Refining Company

Dial RPM DELO:
The Carter Oil Company, Tulsa, Oklahoma
Colonial Beacon Oil Company
Standard Oil Company of Louisiana
Standard Oil Company of New Jersey
Standard Oil Company of Pennsylvania

Kyso RPM DELO:
Standard Oil Company, Inc. in Kentucky

Signal RPM DELO:
Signal Oil Company

Sohio RPM DELO:
The Standard Oil Company (Ohio)

IN CANADA & NEWFOUNDLAND

Imperial RPM DELO:
Imperial Oil Limited

IN BRITISH COLUMBIA & ALBERTA

RPM DELO:
Standard Oil Company of British Columbia Limited

THROUGHOUT THE WORLD

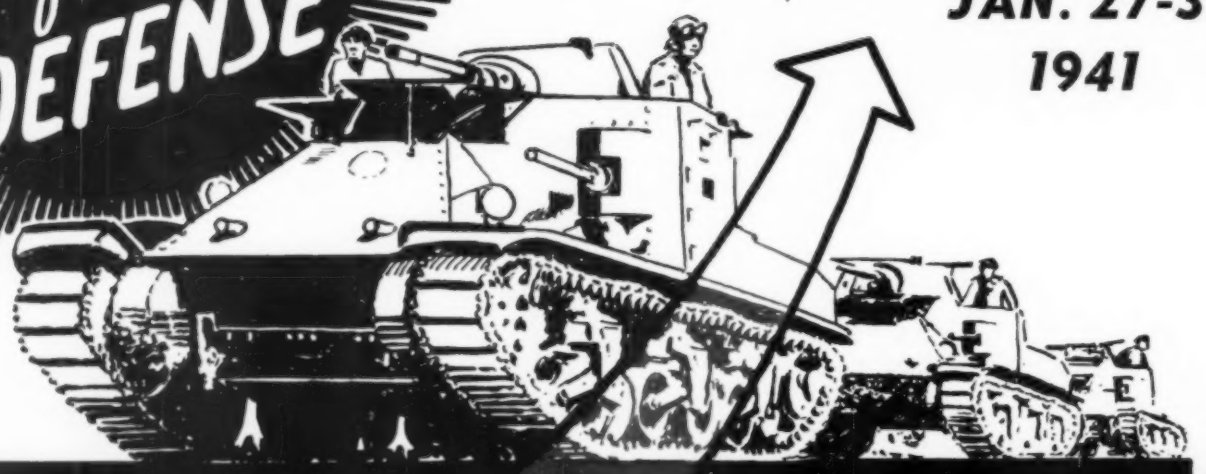
RPM DELO is available through distributors in more than 100 countries.

STANDARD OIL COMPANY OF CALIFORNIA

ROADS for DEFENSE

38th ANNUAL CONVENTION

JAN. 27-31
1941



Pennsylvania Hotel, New York City

AMERICAN ROAD BUILDERS ASS'N

PLAN NOW TO COME!

- Never before an opportunity like this!
- A program designed to help you.
- A chance to hear authorities on all phases of Roads for Defense—and we mean authorities—some of the nation's biggest men with a real practical story for you.
- Talks with experts who will discuss subjects close to your pocket books.
- Intimate discussions in clinic assembly where you can secure the actual answers to your questions.
- Taxes — Airports — Express Highways — Interregional Roads — Traffic Analysis and How to Apply it — Snow and Ice Control — Cutting the Cost of Overhead — The Effect of War on Roads!
- These and many other topics are going to be discussed by men who have found the answers.
- Learn how to make defense dollars do more work.
- Plan now to be there.

CONSTRUCTION METHODS

330 West 42nd Street • New York, N.Y.

(Continued from page 112)

at the base on leveling jacks set on 8x10-in. timber sills.

For each of the two pediments, the scaffold, 36 ft. in length by 75 ft. high, was erected in 2½ days, or the equivalent of 80 man-hours. About one-half as much time was required for dismantling. At the first location, for the west pediment, erection was personally supervised by L. C. Oertle, chief engineer of the Safway Steel Scaffolds Co., Milwaukee, Wis., manufacturer of the scaffolding, acting in cooperation with the Safway Steel Scaffolds Co. of Philadelphia. The latter company, headed by Donald M. Steele, leased the equipment to the National Stone Setters Co.

* * *

Hydraulic Coupling IMPROVES WINCH CONTROL

(Continued from page 66)

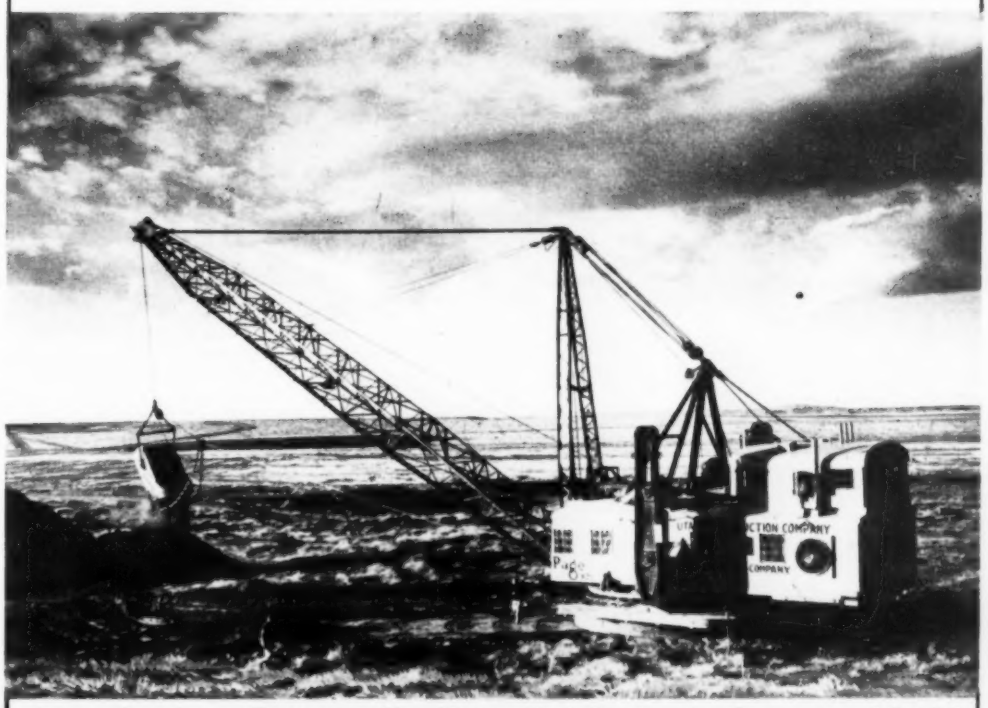
ing the working fluid, is bolted to the impeller and rotates with it. An oil seal prevents leakage where the cover fits around the output shaft.

By virtue of its design, the hydraulic coupling permits the engine to deliver full torque to the coupling even when the output shaft is stalled, the input power being dissipated in the form of heat during the brief interval until the engine speed picks up to a point where the runner in the hydraulic coupling starts to turn. Engine speed then rapidly increases to normal, and the runner simultaneously accelerates to a speed about 2 or 3 per cent less than the normal speed of the impeller, this percentage being the equivalent of the power loss through the coupling. Because the coupling allows the engine to continue running even though the driven shaft is stalled by an overload and because it assures smooth acceleration and deceleration under both starting and overload conditions, all the equipment, including the engine, is saved the wear of sudden jerks and stresses.

Prior to installation of the hydraulic coupling and the present engine, the former four-cylinder gasoline engine, rated 50 hp. at 1,000 r.p.m., had to be governed at that speed to assure sufficient torque for clutch operation of the winch drums. With the flexibility obtained by the hydraulic coupling, no governor is required on the new eight-cylinder engine, rated 85 hp. at 3,600 r.p.m., and the throttle stop has been set at 2,200 r.p.m. (transmitting 65 hp.; engine torque is practically constant above 1,800 r.p.m.). The winch now operates entirely by throttle control, with the drum clutches set tight. The throttle can be cut down to idling speed without stalling the engine and can be moved back to full or partial speed without imposing sudden stress on any part of the machinery.

PAGE TWO-ENGINE DIESEL-POWERED WALKING DRAGLINE

One engine for loading and hoisting
Another separate engine for swinging



On canal work near Tucumcari, New Mexico, Utah Construction Company and Griffith Company use this Page Walker, powered by two Page horizontal Diesels, one mounted above the other. A heavy-duty 6½-cubic-yard Page Bucket is used on a 110-foot boom.

Here is a new development in large draglines—fast hoist and fast swing at the same time! No longer need the operator delay the swing of the machine waiting for the hoisting of the bucket. Rather, with the balanced power of the Page Two-Engine Walker, acceleration of hoisting and swinging is greatly increased.

To understand this faster operation with a Page Two-Engine Walker, visualize using all of the power of your present dragline for hoisting only, without swinging the machine. You will find that the hoisting speed will be increased greatly. Now consider a second independent engine for swinging only. This second engine accelerates the swing in proportion to the faster hoist. The two engines—the large Diesel, which only hoists and loads the bucket, and the smaller independent Diesel for swinging as rapidly as the faster hoist demands—furnish perfectly balanced power and increase the number of loaded buckets that can be handled per minute. Learn what a Page Two-Engine Walker will do on your dragline job.

PAGE ENGINEERING COMPANY
Page Automatic Dragline Buckets · Page Walking Dragline Machines
CLEARING POST OFFICE, CHICAGO, ILLINOIS

WHERE TO BUY

Featuring additional Products and Specialties for the Construction Industry

RED DEVIL
LIGHT
and POWER PLANTS
800 to 50,000 WATTS

3,000 WATT as illustrated on Pneumatic Tires **$395.00**

Finish the job quicker and save money with electricity.

Send for catalog describing generators and our complete line of portable poles for flood lighting.

E. B. KELLEY CO., INC.
43-87 Vernon Blvd.
Long Island City, N. Y.

'Ramsey'
3-SPEED
ALL-STEEL
HAND WINCH

2 Sizes

5-ton capacity — 135-lb. spools, 325' of ½" cable $75
3-ton cap'y — 75-lb. spools, 150' of ½" cable $55

POWER FOR HEAVY LOADS. SPEED FOR LIGHT LOADS.
Gear Ratios: 25:1, 4:1, 1:1.

Write for circular and name of nearest dealer

A few territories are open for live distributors

Manufactured by
RAMSEY MACHINERY CO.
1626 N. W. THURMAN STREET PORTLAND, OREGON

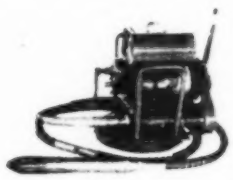
COMPLETE
WELL POINT SYSTEMS
WILL DRY UP ANY EXCAVATION
Faster—More Economically
Write For Job Estimate and 32 page Catalog
COMPLETE
MACHINERY & EQUIPMENT CO., Inc
36-36 11th St., Long Island City, N. Y.
Tel. IRonsides 6-8600
Branch: Third Avenue & Adams St., Gary, Indiana
Telephone: Gary 23983

PROVE FOR YOURSELF THE REAL PROFIT ADVANTAGES OF THE...
New HOBART
Simplified ARC WELDING
SEE WHY IT'S THE "FASTEST SELLING ARC WELDER ON THE MARKET TODAY."
Write for Liberal TRIAL OFFER and Terms
HOBART BROS., BOX CH-1140, Troy, Ohio
FREE Arc Welding Catalog and Information

Guaranteed for One Year!

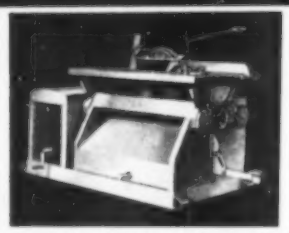
GRIFFIN
WELLPOINTS and PUMPS

Insist on this guarantee when next ordering dewatering equipment.
THERE'S A DIFFERENCE — INVESTIGATE
GRIFFIN WELLPOINT CORP.
725 East 140th St., New York, N. Y.
Phones: MElrose 5-7704-5



Concrete VIBRATORS and Grinders
Write for Circular on types, sizes and prices
White Mfg. Co.
ELKHART INDIANA

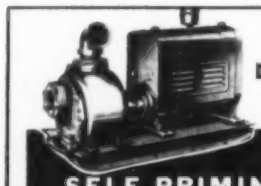
C.H.&E.
No. 33 PORTABLE SAW RIG



• Tilting Table • Swing Arbor—Straight Line • All Welded Construction • Ball and Roller Bearings • V Belt Drive

C. H. & E. MANUFACTURING CO.
3847 N. Palmer St., Milwaukee, Wis.

Giant-Grip Hand Paving Tools
STRAIGHT EDGES — Aluminum or Steel • **EDGERS** — Stamped or Cast Iron • **HAND FLOATS** — Standard or Special • **BULL FLOATS** and **HAND SCREEDS** • **CONCRETE BROOMS** of Bass or Bassine.
L. and M. MANUFACTURING COMPANY
Division of Mondie Forge Company, Inc.
10300 BEREA ROAD, CLEVELAND, OHIO



SIMPLE
DEPENDABLE
RUGGED

1½" to 10"
SELF PRIMING PUMPS
DREDGING AND JETTING PUMPS
Sterling
MACHINERY CORPORATION
111-13 Southwest Blvd. Kansas City, Mo.

On this page

Other men who see this section, *as you are doing,* are *also* interested in anything that has a part in efficient and economical construction operations. How logical, then, to convey information of appropriate construction equipment, material and supplies to these men through advertising right here on this page. Address the

Departmental Advertising Staff
CONSTRUCTION Methods
330 West 42nd St. New York City

SEARCHLIGHT SECTION

Representative Available
Washington Service to Contractors and Suppliers.
Christian of mature dignity, years of experience representing high grade contractors and suppliers — knows his way around Washington — earnestly aggressive. Now available with effective advice, counsel and cooperation for two additional clients. Value of services already demonstrated. Suggest consultation New York, Washington.
RA-123, Construction Methods
330 West 42nd Street, New York City

LEGAL NOTICE

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACTS OF CONGRESS OF AUGUST 24, 1912, AND MARCH 3, 1933.

Of Construction Methods published Monthly at New York, N. Y., for October 1, 1940.

State of New York }
County of New York } ss

Before me, a Notary Public in and for the State and county aforesaid, personally appeared D. C. McGraw, who, having been duly sworn according to law, deposes and says that he is the Secretary of the McGraw-Hill Publishing Company, Inc., publishers of Construction Methods, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, McGraw-Hill Publishing Company, Inc., 330 West 42nd Street, N. Y. C. Editor, Robert K. Tomlin, 330 West 42nd Street, N. Y. C. Managing Editor, None. Business Managers, Albert E. Paxton, 330 West 42nd Street, N. Y. C.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.) McGraw-Hill Publishing Company, Inc., 330 West 42nd St., N. Y. C. Stockholders of which are: James H. McGraw, 330 West 42nd St., N. Y. C. James H. McGraw, Jr., 330 West 42nd St., N. Y. C. James H. McGraw, James H. McGraw, Jr., & Curtis W. McGraw, 330 West 42nd St., N. Y. C. Trustees for: Harold W. McGraw, James H. McGraw, Jr., Donald C. McGraw, Curtis W. McGraw, 330 West 42nd St., N. Y. C. Curtis W. McGraw, 330 West 42nd St., N. Y. C. Donald C. McGraw, 330 West 42nd St., N. Y. C. Anne Hugus Britton, 330 West 42nd St., N. Y. C. Mildred W. McGraw, Madison, N. J. Grace W. Mehren, 72 No. Country Club Drive, Phoenix, Ariz. J. Malcolm Muir & Guaranty Trust Co. of New York, Trustees for Lida Kelly Muir, 140 Broadway, N. Y. C.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the twelve months preceding the date shown above is. (This information is required from daily publications only.)

D. C. McGRAW, Secretary
McGRAW-HILL PUBLISHING COMPANY, INC.

Sworn to and subscribed before me this 27th day of September, 1940.
(Seal) HARRY E. BEIRNE,
Notary Public, Nassau County. Clk's No. 93, N. Y. Clk's No. 974, Reg. No. 2-B-609.
(My commission expires March 30, 1942)

THAT'S DOING IT!

WICKWIRE ROPE

Every wire of a new rope is completely encased with a film of oil. The oil storage is the impregnated hemp center. The supply is sufficient to last for the life of the rope provided "washing out" and evaporation are prevented by the occasional slushing of the outside surface with grease. Should a wire rope become rust-bound through neglect, it is necessary to free the bearings of wire against wire by the use of a thin penetrating oil. A well lubricated rope operates with minimum internal friction. Hence, wire fatigue and internal wear are reduced with the natural resultant of longer wire rope life.

WICKWIRE SPENCER STEEL COMPANY

General Offices: 500 Fifth Avenue, New York City; Sales Offices and Warehouses: Worcester, New York, Chicago, Buffalo, San Francisco, Los Angeles, Tulsa, Chattanooga, Houston, Abilene, Texas, Seattle. Export Sales Department: New York City

Moving?

No Matter—

- **WHERE YOU MOVE**
- **HOW YOU MOVE**
- **WHY YOU MOVE—**

• Make sure Construction Methods follows you wherever you go.

• If you have a new job in view fill in the coupon and mail it today—before you can forget.

• Then it will be there to help you with timely tips and a wealth of information on Engineering & Construction activities.

Please Fill Out "Change-of-Address" Coupon — And Mail To Us Without Delay

Construction Methods
330 W. 42nd St., N. Y. C.

☐ Please change my mailing address.

From

Name _____

Street _____

City _____ State _____

To

Street _____

City _____ State _____

Company _____ Position _____

Nature of Business _____

CONSTRUCTION METHODS
330 W. 42nd St. New York City

Advertisers in this issue

Allis-Chalmers Mfg. Co. ..... 4th Cover
American Bosch Corp. 11
American Cable Division, American Chain & Cable Co. .. 3rd Cover
American Chain Division, American Chain & Cable Co. 35
American Chain & Cable Co.
(American Cable Division) .. 3rd Cover
(American Chain Division) 35
(Hazard Wire Rope Div.) 29
American Steel & Wire Co. 105
Ames Baldwin Wyoming Co. 74
Armco Drainage Products Assn. 34
Armstrong Bros. Tool Co. 84
Atlas Powder Co. 33
Austin-Western Road Mach'y. Co. 87

Baker Mfg. Co. 112
Barber-Greene Co. 16, 17
Bay City Shovels, Inc. 10
Beaver Pipe Tools, Inc. 76
Bethlehem Steel Co. 14
Black & Decker Mfg. Co., The 78
Buckeye Traction Ditcher Co. 107
Bucyrus Erie Co. 31, 103

Carboloy Co., Inc. 94
Carnegie-Illinois Steel Corp. 20
Caterpillar Tractor Co. 18,19
C. H. & E. Mfg. Co. 116
Chain Belt Co. 98
Cleveland Tractor Co. ..... Center Spread
Clipper Mfg. Co., The 84
Clyde Iron Works, Inc. 98
Commercial Shearing & Stamping Co. 108
Complete Machinery & Equipment Co., Inc. 116
Construction Machinery Co. 108
Cummins Engine Co. 71

Dixon Valve & Coupling Co. 88
Duff-Norton Mfg. Co. 80
du Pont de Nemours & Co., Inc., E. I. 30

Electric Tamper & Equip. Co. 112
Ensign-Bickford Co. 70
Euclid Road Machy. Co. 7

Foote Company, Inc. 101
Ford Motor Company 28

General Electric Co. 99
General Motors Truck Corp. 95
Gorman-Rupp Co. 112
Griffin Wellpoint Corp. 116
Gulf Refining Co. 24

Haiss Mfg. Co., Geo. 90
Harnischfeger Corp. 77
Hazard Wire Rope Division American Chain & Cable Co. 29
Heil Company, The 9
Hobart Bros. Co. 116

Independent Pneumatic Tool Co. 8
Inland Steel Co. ..... 2nd Cover

Jaeger Machine Co. 84, 94, 102, 110

Kelly Co., Inc., E. B. 116
Koehring Company, The 38

L & M Mfg. Company 116
La Plant-Choate Mfg. Co. 23
Lehigh Portland Cement Co. 37
Leschen & Sons Rope Co., A. 109
Le Tourneau, Inc., R. G. 15
Lima Locomotive Works, Inc. 85
Lincoln Electric Company 26
Lion Oil Refg. Co. 97
Lone Star Cement Corp. 5
Lowell Wrench Co. 73
Lufkin Rule Co., The 88

Macwhyte Co. 22
Mall Tool Co. 102
Marion Steam Shovel Co. 27
Master Builders Co., The 83
McGraw-Hill Book Co., Inc. 92
Michigan Power Shovel Co. 111
Moretrench Corp. 82

National Carbide Corp. 108
Northwest Engineering Co. 21
Novo Engine Co. 89

Owen Bucket Co. 100

Page Engineering Co. 106, 115
Power King Tool Corp. 104

Ramsey Machry. Co. 116
Roebling & Sons Co., John A. 69
Rogers Bros. Corp. 96

Schramm, Inc. 100
Searchlight Section 116
Shell Oil Company 79
Sinclair Refining Co. 32
Skilsaw, Inc. 72
Smith Company, T. L. 91
Smith Engineering Works 12
Standard Oil Co. of Calif. 113
Standard Oil Co. of Indiana 36
Sterling Machinery Corp. 116
Sterling Wheelbarrow Co. 90
Syntron Co. 80

Templeton, Kenly & Co. 96
Texas Company, The 6, 93
Thew Shovel Co. 13
Thornton Tandem Co. 104
Timber Engineering Co. 75
Tower Co., A. J. 104

U. S. Steel Corp. Subsidiaries .. 20, 25, 105
Universal Atlas Cement Co. 25
Universal Road Mach'y Co. 106

Vulcan Iron Works 94

Wellman Engineering Co. 82
Wenzel Tent & Duck Co., H. 102
White Mfg. Co. 116
Whiteman Mfg. Co. 86
Wickwire Spencer Steel Co. 117
Williams Company, J. H. 81

GIVE ME AMERICAN CABLE TRU-LAY PREFORMED Every Time—

1 It resists kinking.
2 It spools better
3 It requires no seizing
4 Broken crown wires lie flat and in place
5 It is easier and safer to handle
6 It reduces unproductive shutdowns
7 It lasts longer—gives better service
AMERICAN CABLE
TRU-LAY Preformed
WIRE ROPE

GREEN SIGNIFIES SAFETY

"Whenever my ropes must operate over sheaves or drums . . . then I want American Cable's TRU-LAY Preformed. It has greater fatigue resistance; lasts longer; is easier to work."

So say thousands of operators from every industry. Nor do they say and believe that just because *we* insist upon it in magazine advertisements. They *know* from actual field and plant experience extending over a period of years.

Join the rapidly increasing ranks of industrial money and time savers by specifying American Cable's TRU-LAY Preformed. *All* American Cable's Wire Ropes made of Improved Plow Steel are identified with the **Emerald Strand.**

BUY ACCO QUALITY—*whether in American Cable Division's Ropes—American Chains (Weed Tire Chains and Welded or Weldless Chains)—Campbell Abrasive Cutting Machines—Page Wire Fence—Page Welding Wire—Reading-Pratt & Cady Valves—Wright Hoists or any other of the 137 ACCO Quality Products.*

AMERICAN CABLE DIVISION
WILKES-BARRE, PENNSYLVANIA
District Offices: Atlanta, Chicago, Detroit, Denver, Los Angeles, New York, Philadelphia, Pittsburgh, Houston, San Francisco

In Business for Your Safety

ACCO
AMERICAN CHAIN & CABLE COMPANY, Inc.

Full Speed Ahead

FOR NATIONAL DEFENSE

MODERN METHODS EMPLOYED BY CONTRACTORS & HIGHWAY OFFICIALS

1 **PUSHER-LOADING**—Push or pull large capacity Gar Wood cable or hydraulic scrapers with the fast, powerful, "HD 14" 2-cycle Diesel tractors. Pusher loading means more yardage per trip—higher "HD 14" hauling speeds mean more trips per hour.

2 **FASTER BULLDOZING**—Leveling, clearing and grading is speeded up with 2-cycle Diesel's throttle control, quick pick-up, easy maneuverability, high forward and reverse speeds.

3 **BLADE GRADING**—Leaning Frame Grader provides wider blade range, more accurate work and greater stability. Enables operator to cut harder banks and ditches—to handle more dirt per round—to complete the job faster and more accurately than with any other drawn grader.

4 **EXCAVATING**—Rough shovel and loader—digs—carries—dumps—spreads and levels. ½ yard bucket, quickly interchangeable with bulldozer or angle dozer blades. Mounts on own transport wheels—no trailer required. Cuts digging and loading costs—speeds up operations.

5 **SPOT DUMPING**—Gar Wood-Continental scraper end-dumps like a truck. Makes it possible to deposit material over slopes, around culverts or against bridge abutments. Especially handy for digging ditches, cleaning up or finishing. Built in 3, 5, 8, or 11 yard capacities.

GASOLINE AND DIESEL TRACTORS

ALLIS-CHALMERS

TRACTOR DIVISION—MILWAUKEE, U.S.A.

ENGINES AND ROAD MACHINERY